TRAUMA, COPING AND RESILIENCE AMONG CONFLICT-AFFECTED YOUTH IN EASTERN DEMOCRATIC REPUBLIC OF CONGO

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Abstract

Youth affected by armed conflict endure a variety of potentially traumatic stressors and how youth employ coping strategies is important to understanding mental health resilience. The purpose of this study was to 1) examine youth coping strategies within the socio-cultural context of the Eastern Democratic Republic of Congo 2) evaluate associations with mental health and well-being outcomes and 3) evaluate external factors at the individual, peer, family and community level to create an integrative model of youth mental health resilience. This thesis research is nested within Dr. Nancy Glass's animal husbandry microfinance intervention studies Rabbits for Resilience (RFR) and Pigs for Peace (P4P), in the Walungu Territory in Eastern DRC. Qualitative research documented youth defined traumatic events and coping strategies. An adapted KidCope scale measured use of coping strategies. Factor analysis revealed four coping strategies utilized by youth; problem focused, emotion focused, avoidance and faith based coping. Hierarchical regression analysis was used to assess associations with internalizing and externalizing problems, prosocial behavior and self-esteem. Structural equation modeling was used to model paths between potentially traumatic exposures, coping, and external factors at the peer, family and community level. Problem focused coping was associated with increased internalizing and externalizing problems and lower prosocial behavior in both boys and girls. Emotion focused, avoidance and faith based strategies were associated with better self-esteem. When problem focused strategies were used with emotion focused strategies, the result was fewer internalizing problems in girls and fewer externalizing problems in boys and girls. This finding suggests that coping strategy flexibility may be particularly useful in dealing with potentially traumatic events. Home environment and caregiver health had a significant impact on psychological distress, while peer relationships, community relationships and enrollment in school benefited well-being. Results suggest that interventions should: 1) target support for multiple (grouped) coping strategies at the individual level; 2) support reduction in psychological distress through improved family relationships and caregiver mental health, and 3) target improved well-being through support of peer and community relationships and school enrollment.

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Preface

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Background and Context

Armed Conflicts and Mental Health of Children

Children affected by armed conflict endure a variety of traumatic stressors that impact their psychosocial health and well-being. Globally it is estimated that within the past decade, two million children lost their lives to war, six-million were severely injured or disabled, twelve million were left destitute and 300,000 children served as child soldiers (UNICEF., Children, & Conflict, 2009). In 2014, UNHCR estimated that there were 19.5 million refugees and 38.2 million internally displaced persons with children below the age of 18 constituting 51% of the worldwide refugee population (UNHCR, 2015). Children in conflict settings are often victims of physical and sexual assault, witness violence to family and their community and are subject to chaos and destruction of their environments which can result in material deprivation, forced displacement, and lack of basic needs for food, shelter and security. The psychological impacts of war on children includes increased prevalence of post-traumatic stress disorder (PTSD), anxiety, depression (A. Thabet, Abed, & Vostanis, 2004), psychophysiological disturbances such as nightmares and trouble sleeping, fear, grief, behavioral problems (Bayer, Klasen, & Adam, 2007), changes in school performance, lack of hope and personality changes (Kuterovac-Jagodic, 2003). Despite exposure to traumatic stress, not all children react in the same ways and it is possible for children to employ a variety of adaptive coping strategies that can help improve or harm their mental health and well-being.

To date, most research on war affected children has focused on PTSD (Mark JD Jordans, Tol, Komproe, & De Jong, 2009). Pooled prevalence estimates from 17 war affected countries found the impact of war resulted in 47% of children with PTSD, 43% with depression and 27% with anxiety (Attanayake et al., 2009). Armed conflict not only results in psychological distress in the short term, but can also lead to long-term psychopathology. Research with former child soldiers in Mozambique found 50% of participants reported traumatic stress

reactions sixteen years after return to civilian life (Boothby, Crawford, & Halperin, 2006). Furthermore, protracted conflict involving non-state actors such as rebel groups directly and indirectly harms child development and weaken health care delivery systems (T. S. Betancourt & Khan, 2008). Research has identified multiple trajectories in adaptation to trauma among disaster exposed individuals, however more research is needed to understand what factors predict better or worse resilience outcomes (Masten & Obradovic, 2008).

Exposure to violence

Exposure to violence is the factor with strongest evidence base for psychological distress (Reed, Fazel, Jones, Panter-Brick, & Stein, 2012). Interest has grown on whether previous exposure to violence produces protective effects such as inoculation or vulnerability effects such as sensitization leading to different reactions to future adversity (Masten & Narayan, 2012). Among war-affected children a stressor is defined as traumatic when it threatens a child's life or physical integrity and elicits a subjective response of fear and helplessness (Klasen et al., 2010). While moderate levels of stress may result in skill building that will equip an individual to overcome future adversity, in general, frequency of exposure to trauma is believed to weaken processes of resilience. Most studies on conflict create an index of trauma by summing the different types of traumatic events experienced throughout the lifetime. While most research has analyzed exposure to trauma as a cumulative index, an alternative approach could be to consider classifying different types of exposure such as direct, indirect, vicarious, witnessed, or by proximity to context (B. K. Barber, 2013). For example, Reid-Quinones et al 2011, found that youth who were victimized were angry and coped by using primary engagement, social support and aggressive strategies whereas youth who had witnessed violence were fearful, focused on survival and coped by using avoidant strategies (Reid - Quiñones et al., 2011). A study by Mollica among Cambodian refugees found that trauma events could be categorized as

1) material deprivation; 2) warlike conditions; 3) bodily injury; 4) coercion and 5) violence to others (Richard F Mollica, 2004). Betancourt 2010 found that two years after follow up on Sierra Leone child soldiers, that boys who had witnessed someone being wounded or killed displayed higher levels of hostility and girls who had been raped had higher levels of anxiety and depression (T. S. Betancourt, Brennan, Rubin-Smith, Fitzmaurice, & Gilman, 2010). A recent study in eastern DRC found that 95% of youth reported at least one traumatic event and on average adolescents were exposed to 4.7 traumatic events (Mels, Derluyn, Broekaert, & Rosseel, 2009). Investigating exposure by type of trauma would allow for identification of the specific types of traumatic exposure that are most detrimental to mental health and well-being.

Mental Health Among Trauma Affected Youth

Among war affected Children in Croatia, more violent experiences were related to increased depression in boys (Brajsa-Zganec, 2005). In Uganda, adolescents in two IDP camps who had more adverse life experiences showed less improvement in depression and anxiety over time (Haroz, Murray, Bolton, Betancourt, & Bass, 2013). One study among Palestinian children found that exposure to trauma had a significant effect on major depressive disorders, but not PTSD (A. Thabet et al., 2004), whereas another study among Palestinians and Israeli youth found exposure to trauma was associated with post-traumatic stress (Dubow et al., 2012). A study by Kuterovac-Jaodic, 2003 found that among 252 Croatian children who had been subjected to military attacks from Yugoslavian forces, children who were less likely to recover from PTSD experienced stronger short term PTSD reactions and were more likely to be eye witnesses to violence (Kuterovac-Jagodic, 2003). Research on child soldiers has found lasting effects due to exposure to violence.

Four characteristics of childhood trauma that last for long periods of time include intrusive memories of the traumatic event, repetitive behaviors, trauma-specific fears and altered attitudes towards people, life and outlook of the future (Klasen et al., 2010). Research from war-

affected children shows PTSD symptoms range in prevalence rates with 27 to 98% meeting the criteria of PTSD (Klasen et al., 2010). Among former child soldiers in Nepal, prevalence of depression was estimated to be 53.2% and prevalence of anxiety was estimated to be 55.3% (Kohrt et al., 2008). A recent study in eastern DRC found that 52% of adolescents met the criteria for PTSD (Mels et al., 2009). Research from war-affected Palestinian children ages 10-14 found that those who were exposed to trauma were more likely to have aggressive and antisocial behavior (S. Qouta, Punamaki, Miller, & El-Sarraj, 2008).

Well-Being Among Trauma Affected Youth

Hobfall's (2001) conservation of resources theory suggests that resources available to an individual are central to predicting future well-being (Hobfoll, 2001). Included among these resource are concepts of self-esteem and a sense of pride in oneself, optimism and hope for the future, sociability and involvement with others and general health and functioning. Research from war-affected youth in Northern Uganda found youth functioning and prosocial behavior to be associated with less emotional distress (Bolton et al., 2007). Self-esteem is a construct that seeks to capture the extent to which a person believes they are, "capable, significant, successful and worthy" (Salami, 2010). Research indicates that individual's self-esteem is protective against risk (Rutter, 1987). Self-esteem may be directly related to psychological health, with findings indicating that self-esteem protects against suicidal ideation and substance use (Kidd & Shahar, 2008). Belief systems, whether religious or not, provide a person with a sense of hope. Coherence and meaning to life are integral in constructing one's worldview. Hope is an expression of cultural values that give order and promise to life. Eggerman et.al (2010) define hope as, "belief that adversity can ultimately be overcome and a process of meaning-making that gives coherence to past, present, and future experiences" (Eggerman & Panter-Brick, 2010).

Hage 2003 argues society is a mechanism to distribute social hope: access to resources reduces or encourages dreams of social mobility (Hage, 2003; Leipold & Greve, 2009). In this

way hope is rooted in social relationships and defined by cultural values and ideals. In Afghanistan, hope was defined as the sustained adoption of cultural values including faith, individual effort, endurance and perseverance (Eggerman & Panter-Brick, 2010). The construct of hope is important for both individuals and wider communities. Leipold and Greve 2009, argue that , "ideologies of hope have significance for individual and collective resilience, social identity and social dynamics across successive generations" (Leipold & Greve, 2009). Being hopeful about the future is associated with fewer depressive symptoms and risk behaviors, and higher levels of life satisfaction in youth (Richard M. Lerner, Bowers, Geldhof, Gestsdóttir, & Desouza, 2012; Mak, Ng, & Wong, 2011). Among former child soldiers, those with greater spiritual support had better resilience outcomes (Klasen et al., 2010).

Age and Gender

Age moderates exposure, adaptive responses and function capacity in many different ways (Masten & Narayan, 2012). Age is often related to exposure, but is also associated with adaptive coping processes and mental health outcomes in children. During war older children experience more trauma, have the cognitive capacity to understand what's going on and have greater exposure to gender and sexual based violence (Masten & Osofsky, 2010). Research on war affected children is mixed showing that at younger ages, youth maybe more vulnerable to experiences of trauma (Mels, Derluyn, Broekaert, & Rosseel, 2010), but that younger children may also be better protected by caregivers than older children (Masten & Narayan, 2012). In Cambodian refugees high exposure to trauma was associated with age (older children have more exposure) and both lifetime and current PTSD (Masten, 2011). Age has also been shown to moderate coping strategies (Mels, Derluyn, Broekaert, & Garcia-Perez, 2013).

Gender is another factor that can moderate resilience processes. Research indicates that males and females experience, interpret and report traumatic experiences differently (Masten & Osofsky, 2010). In this way, gender is a moderator and not mediator because there are

differences in exposure (T. S. Betancourt et al., 2010). For example research by Quota et al found that among Palestinians in Gaza, parents tended to protect and restrict movement of girls whereas boys were allowed greater mobility and contact with the conflict (S. Qouta et al., 2008). There are many arguments for differential effects on mental health by gender. Some research indicates that males display more externalizing behavior whereas females have more internalizing behaviors associated with coping processes after exposure to trauma (Crick & Zahn-Waxler, 2003). These behaviors may result in boys having more aggressive behaviors than girls (S. Qouta et al., 2008) and girls displaying more depression than boys (Reed et al., 2012). More recent research supports the idea that stress response may differ on the neurobiological level with stress responses indexed by cortisol showing different patterns by gender (Vigil, Geary, Granger, & Flinn, 2010). Much research has shown that gender modifies the relationship between exposure to trauma and psychological symptoms (Mels et al., 2013).

The Conflict in the Democratic Republic of Congo

The Democratic Republic of Congo (DRC) has endured two wars and armed conflict has persisted between rebels and government forces for over 17 years, devastating health and social infrastructure. A history of colonialism, theft of the DRC's enormous mineral wealth and strategic 'pitting' of ethnic groups against one another set the stage for conflict once the DRC gained independence. Mobutu Sese Seko's autocratic rule for over three decades as President caused decay of state institutions and in response, a 1997 rebellion supported by Rwanda and Uganda overthrew Mobutu. His successor, Laurent Kabila was challenged in 1998 by Rwandan and Ugandan troops in the eastern part of the country igniting another regional conflict. In 2001 Kabila was assassinated and was succeeded by his son, Joseph Kabila and in 2005, a new constitution was drafted. Since 2005, violence has ensued due to a political economy that continues to be rife with corruption, looting by international actors for resources, and complex disputes between ethnic communities.

In the Democratic Republic of Congo (DRC), protracted conflict has caused instability, destruction of infrastructure and resources, forced displacement and experiences of ongoing violence. In 2014 UNHCR estimates that there are 119,754 refugees and 2,756,584 internally displaced persons living in the Democratic Republic of Congo (UNHCR, 2015). It is believed that 30,000 children are child soldiers with armed groups in DRC (McMullen, O'Callaghan, Shannon, Black, & Eakin, 2013). Violence, population displacement and the destruction of health and educational institutions has occurred throughout the country and has acutely impacted eastern DRC where conflict related violence has continued.

A cross-sectional study in the eastern DRC found that 39.7% of those surveyed reported sexual violence including 23.6% among women and 39.7% among men(Johnson et al., 2010). Human rights abuses were reported in 77% of households with 41% of adults meeting symptom criteria for major depressive disorder and 50.1% meeting criteria for PTSD (Johnson et al., 2010). A study with youth in eastern DRC found that on average, youth were exposed to 4.8 potentially traumatic events (Mels et al., 2013).

Literature Review

Historical Development of Resilience Research

Resilience has roots in the Latin verb, *resilire*, which means to rebound (Almedom & Glandon, 2007). The concept of resilience first emerged in the fields of ecology and psychology in the 1970s to explain variability in individual outcomes when exposed to similar risks. While there are many domains to which the term "resilience" has been applied, this research focuses on resilience in mental health. The field of mental health resilience research was pioneered in the early 1970s with research focusing on positive adaptation for children at risk for psychopathology (Garmezy, 1971; Kolar, 2011). Subsequent research has focused on identifying

factors that allowed some individuals to cope better than others when faced with adversity (Garmezy, 1971; Masten, 2013; Masten, Neemann, & Andenas, 1994; Rutter, 1987; Emmy E Werner & Smith, 1982). Resilience has been defined as "the attainment of desirable social outcomes and emotional adjustment, despite exposure to considerable risk" (T. S. Betancourt & Khan, 2008) and can be conceptualized as not only the absence of negative effects, but also the existence of positive effects. This is an important perspective because, mental health is not just the absence of disease, rather, it also includes wellness, or well-being (World Health Organization, 1946). Well-being can be defined as, "a state of being with others and the natural environment that arises where human needs are met, where individuals and groups can act meaningful to pursue their goals and where they are satisfied with their way of life" (Armitage, Béné, Charles, Johnson, & Allison, 2012).

International research on resilience was influenced by publicity of suffering of children, beginning around the time of World War II and expanded in parallel to the development of UNICEF, which brought recognition to the needs of children in humanitarian emergencies (Masten, 2013). The majority of resilience research has focused on youth populations, as researchers seek to better understand developmental trajectories during the complicated period of adolescence. Some scholars have argued that contexts of political conflict are the "ultimate challenge to resilience" where serious life adversities and extreme trauma affect whole populations (B. K. Barber, 2013).

Definitions of Risk

A criticism of resilience research concerns the absence of a unifying definition and conceptual framework that encompasses its integration across disciplines. While there is some variation in definitions of resilience, in general all resilience definitions include the concept of risk or adversity and adaption or coping despite that risk. The differences in definitions found in the literature exist because concepts of resilience have developed to address diverse research

questions in a multitude of social and cultural contexts. In general, risk or adversity is usually defined as a stressor, hazard or exposure to traumatic experiences. Most research conceptualizes risk as any event or factor that increases the likelihood of the onset or maintenance of psychological distress (T. S. Betancourt & Khan, 2008; Kia-Keating, Dowdy, Morgan, & Noam, 2011). The threshold that defines what is a risk has been disputed. For example, some researchers have relaxed the definition of risk to include any stressful experiences or hardship, whereas others have defined adversity more precisely as encompassing "negative life circumstances that are known to be statistically associated with adjustment difficulties" (Luthar, Cicchetti, & Becker, 2000).

While risk is an integral component to the concept of resilience, the focus of resilience research is the adaptation to or coping with that risk. Whereas risk focused interventions concentrate on removal or avoidance of risk factors that result in negative outcomes, resilience research focuses on supporting processes of positive adaptation. In this way, resilience research can be considered 'strength based' research, focusing on assets and protective factors rather than risks. An asset can be defined as a factor that provides a future benefit. Assets may include economic stability, education, social support networks and other factors that would promote resilience. Adaptation can be defined as responses and processes related to well-being in the face of adversity. Adaptation can be internal (absence of pathology and psychological well-being) and external (sociability, academic achievement, engagement in socially appropriate activities)(Theron, Theron, & Malindi, 2013). Successful coping has been measured in many ways including the absence of psychopathology, achievement of functionality, as well as prosocial behavior and involvement in cultural/community norms (Tol, Song, & Jordans, 2013).

Coping Among Trauma Affected Youth

Theoretical Background of Coping Strategies

Research with youth has examined the relationship between coping strategies, mental health and well-being. How youth deal with stress can reduce effects on mental health or amplify emotional distress and associated internalizing and externalizing behaviors (Ellen A Skinner, Edge, Altman, & Sherwood, 2003). The concept of coping, which describes responses to stress, emerged from Lazarus and Folkman's stress theory which describes stress in terms of individual personal appraisal whereby a person appraises an event as "exceeding his or her resources and as endangering well-being mobilize" (Lazarus, 1984). This theory posited that the best way to measure coping was through an individual's personal appraisal, which refers to the various ways individuals seek to modify adverse aspects of their life to minimize the internal threat of stressors. Appraisal can be primary (perception of a stressor) or secondary (evaluation of potential effectiveness and consequences of coping behaviors) (Lazarus, 1984). Coping is effective if stress is accurately appraised and specific behavioral and cognitive strategies are used to manage, reduce or tolerate stressful events (Folkman & Moskowitz, 2004). Coping strategies can have short-term effects, for example helping to resolve the immediate stressor, and long-term effects on mental health and well-being (Ellen A Skinner et al., 2003).

Research has described a variety of coping strategies with little consensus on how those strategies should be conceptually grouped and inconsistency on how beneficial or harmful particular strategies may be (Compas, Connor-Smith, Saltzman, Thomsen, & Wadsworth, 2001; E. A. Skinner & Zimmer-Gembeck, 2007). Lazarus and Folkman's work characterizes coping strategies as 'emotion centered' which seeks to regulate internal emotions and may include cognitive distraction, seeking emotional support, emotional expression and cognitive restricting and problem or 'situation based' which aims to change the problem or conflict (Lazarus, 1984). Other terms used to describe coping include 'engagement' or 'problem based' coping (active/approach styles); 'disengagement' or 'emotion focused' coping (avoidant/passive styles)

(Ebata & Moos, 1994; Sandler, Tein, & West, 1994); religious and ideological coping (Khamis, 2012); and primary vs. passive coping (Wadsworth, Santiago, & Einhorn, 2009).

A recent study with war-affected children in Croatia found six distinct types of coping strategies including aggressive activities, problem oriented, avoidance and relaxation, emotion expression and social support seeking (Kuterovac-Jagodic, 2003). A review of more than 100 assessments of coping revealed that no two included the same set of categories and there were over 400 different labels used to describe those categories (Ellen A Skinner et al., 2003). The lack of consensus on how to distinguish coping strategies has not deterred researchers from maintaining belief that coping matters, rather it may suggest that coping is context dependent. Table 1 provides an overview of research on conflict affected youth and coping strategies defined from factor analysis among conflict-affected youth.

Table 1. Results of factor analysis of coping scales among conflict-affected youth

Authors	Conflict Setting	Ages	Coping Assessment	Coping Strategies
(Kuterovac-Jagodic, 2003)	Eastern Croatia after massive attacks from Yugoslavia from 1991-1993.	Mean Age 10.5	Revised School-Agers' Coping Strategies Inventory (SCSI-R)	Distraction Aggressive Activities Problem Oriented Strategies Avoidance and Relaxation Emotion Expression Social Support Seeking
(Pat - Horenczyk et al., 2009)	Israeli and Palestinian youth exposed to severe political violence	12-18	Brief COPE (Carver, 1977)	Adaptive Maladaptive
(Benson et al., 2011)	Bosnian youth five years post-war	15-20	Responses to Stress Questionnaire (RSQ; Connor-Smith et al., 2000)	Primary control engagement coping Secondary control engagement coping Disengagement coping Involuntary Stress Response
Weisenberg et. Al 1993	Israeli after Persian Gulf war, youth exposed to scud missile attacks	Grades 5, 7, 10	Revised Global symptom score	Checking Verbal Distraction Reassurance Request Distraction=Avoidance Wish Fulfillment
Abdelaziz et. Al. 2013	Gaza and West Bank	8-16	Adolescent Coping Orientation for Problems Experiences (A-Cope – Patterson and McCubbin 1987)	Engaging in Demanding activity Self reliance and optimism Developing social support Seeking Diversions Solving family problems Seeking spiritual support Investing in close friendships

				Use of Humor Seeking professional support Relaxing Ventilating feelings Avoiding problems
Elklit et. Al 2012	Bosnian and Herzegovina refugees	15-27	The Coping Style Questionnaire (CSQ)	Problem Focused Coping Emotion Focused coping Avoidant (not factor)
Braun-Lewensohn et al (2011)	Israeli adolescents under missile attacks in southern Israel	12-18	Adolescent Coping Scale(ACS-Frydenberg and Lewis, 1993)	Problem-focused coping Emotional coping

Some research has found that emotion oriented coping is associated with poorer mental health outcomes whereas task or problem based coping is associated with better mental health outcomes (Campbell-Sills, Cohan, & Stein, 2006; Khamis, 2015; McMahon et al.). However, other researchers have questioned whether emotion focused coping should be considered maladaptive. The finding that emotion focused coping is maladaptive may be confounded if both adaptive and maladaptive emotional strategies are grouped within the same conceptual "emotion focused" coping strategy (Compas et al., 2001). For example, distraction or "just trying to forget it" has been considered a maladaptive and an avoidant coping strategy, however researchers have questioned whether disengagement and avoidant strategies should be considered maladaptive, particularly because in contexts of armed conflict, these strategies may be preferred by adolescents and their effect may be context dependent, requiring additional research specific to a particular context (Jones, 2002; Mels et al., 2013). In environments such as humanitarian emergencies and armed conflict, engagement (problem focused) coping may be a less appropriate coping method than disengagement (emotion focused) coping because youth may be powerless to actively change stressors related to the emergency and instead emotion focused coping may be a positive strategy that is more easily accessible than problem focused strategies. Other studies suggest that *coping flexibility* or use of multiple strategies (i.e. problem and emotion focused strategies) may help explain the impact of emotion or problem focused

strategies on outcomes and suggest that coping flexibility may lead to better outcomes (Weisz, McCabe, & Dennig, 1994).

Context Specific Research on Coping

Stress and coping exist within an individual's unique context with social, cultural, economic and historical processes influencing the types of stress experienced in the past, present and future as well as the coping strategies utilized. In this way, coping is a reflective phenomenon and coping strategies cannot be separated from the situation or individual. Understanding adaptive behaviors is context dependent, and, "what is adaptive in one context or during one developmental period may be maladaptive during another" (Theron et al., 2013; Ungar, Ghazinour, & Richter, 2013). Defining positive or negative adaptions requires a set of assumptions about perceived desirability of that adaptation (Masten, 2001). Research suggests that emotion focused coping may be more beneficial in contexts where nothing can be done to modify the stressor (Pincus & Friedman, 2004). In addition, coping strategies may be influenced by age and developmental stage. For example, children's coping strategies may shift from behavioral to cognitive strategies as they develop; where as children mature they may be more apt at calming themselves down and seeking social support as compared to avoidant strategies such as trying to forget or social withdrawal which may be more prevalent among younger children(Compas et al., 2001).

Researchers caution against relying on normative judgments derived from western culture (Ungar et al., 2007). Considering the cultural context in which coping strategies are employed is essential to gain depth of meaning to motivations for employing a particular strategy and the positive or negative effects of using that strategy (Barenbaum, Ruchkin, & Schwab-Stone, 2004). A qualitative case-study found that traumatized Cambodian refugees utilized avoidant coping including avoiding thoughts, behaviors and activities that reminded them of the past and linked this coping strategy to a history of "dishonorable events in Cambodian history"

and collective shame felt by Cambodians (Kinzie, Fredrickson, Ben, Fleck, & Karls, 1984). The Cambodian belief system perceives personal bad fortunes stem from dishonorable events in a previous life and therefore led individuals to use avoidant coping strategies rather than more problem focused strategies. Qualitative narrative research with Sudanese youth refugees found that a sense of communal self was thematic in interviews and that suppression and distraction were common coping strategies (Goodman, 2004). Participants used distraction to avoid difficult thoughts and feelings and believed this strategy helped "protect themselves from feelings that they feel powerless to handle"(Goodman, 2004).

Research with Zimbabwean adolescents found there was greater use of emotion focused strategies than problem solving strategies because cultural norms in Zimbabwe discourage problem solving strategies that may involve confrontation or challenging elders. Instead youth favor distancing, keeping to themselves and other emotion focused strategies that may be more characteristic of a collectivistic society versus an individualistic society (Magaya, Asner-Self, & Schreiber, 2005). Whereas in Western societies coping strategies are often connected to an individualistic approach whereby youth seek help such as counseling, in developing countries and contexts where youth have experienced armed conflict, the coping approach may be more collective in nature. In addition, cultural norms and gender role expectations can influence types of coping strategies utilized by youth. For example, a mixed method study among Palestinian refugee youth ages 8-17 living in Gaza found that girls were less likely to use coping strategies that would require them to be far from home and used more strategies that involved being close to home such as praying in the home, whereas boys were more likely to use leisure activities and relaxation activities outside of the home (Hundt, Chatty, Thabet, & Abuateya, 2004).

Defining Resilience Processes

A sentinel paper published by Rutter in 1987 defined resilience by stressing resilience as an integrated process of negotiating risk that changes over time (Rutter, 1987). For example,

how an individual reacts to a type of risk at one point, does not indicate how the individual will cope with similar risk at another point in time. At different points in time, individuals have varying relationships, support systems and socio-cultural contexts that affect their adaptive capacity. Rutter's arguments supported the shift in research from the study of risk and protective factors to risk and protective *processes*. In this light, resilience was defined as "a dynamic process involving an interaction between both risk and protective processes, internal and external to the individual, that act to modify the effects of an adverse life event" (Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003; Rutter, 1987). Increasingly research focused on dynamic processes of adaptation, considering how processes themselves changed over time. The mechanisms by which risks and assets interact with adaptive processes involves a developmental progression as an individual encounters new risks and assets with changing life circumstances (Luthar et al., 2000). Olsson conceptualized resilience as a, "dynamic process of adaptation to a risk setting that involves interaction between a range of risk and protective factors from the individual to the social" (Olsson et al., 2003).

Particularly with youth, resources and relationships with other people, settings and systems shape adaptive capacity (Masten, 2013). There are many reasons that war causes negative outcomes in children. These include, loss of loved ones, living with distressed adults, lack of educational structure, lack of normalcy in everyday living, poor physical environment, injury, and effects to the central nervous system structure and function from long term exposure to trauma (Joshi & O'Donnell, 2003). As a process, and not an inherent trait, Masten,1994, cautions against using the term "resiliency" as it carries connotation of a personality trait, whereas current evidence suggests that resilience is less a result of individual traits and more related to a child's social ecology (Luthar et al., 2000; Masten et al., 1994).

Youth resilience depends on interactions with external factors and includes relationships on multiple levels within a particular social ecology. Adaptive capacity is influenced by systems

external to the individual such as family, community and cultural systems. Resilience researchers identified the importance of relationships with other individuals, settings and contexts and have sought to integrate peer, family, social and community factors into resilience research (Masten, 2001; Ungar & Liebenberg, 2009). Conceptualizing processes as reciprocal and adaptive raises new questions of scale. For example resilience could be conceptualized as encompassing adaptive processes on many levels including the immune system, stress-response system, family system, community system, ecosystem (Masten, 2011). Recent research has begun to explore gene-environment interactions and biologic processes that affect individuals' adaptive capacity (Rutter, 2012). Curtis and Cochiti argue for the potential of brain imaging and other technologies in the study of resilience in order to understand possible relationships between mechanisms of neural plasticity and resilience related outcomes (W John Curtis & Cicchetti, 2003). For example, research indicates that hemispheric electroencephalogram (EEG) asymmetry across central cortical regions can be used to distinguish between resilience in children where greater left hemisphere activity was observed among those who were more resilient (W. J. Curtis & Cicchetti, 2007). Lerner 2006, describes resilience as capturing the interactions between individuals and their socio-ecological environment and notes that processes can be reciprocal and adapt over time (R. M. Lerner, 2006). Peer relationships are also important to youth mental health and well-being, where feeling close to peers and belonging is important in adolescence. Having friends and feeling close to friends are sources of support for youth impacted by traumatic events. Peer relationships can also be an important source of coping skill acquisition, exposing youth to ways others cope and providing opportunities to implement coping skills as a group such as engaging in a particular problem solving strategy. Self-esteem for example, may be enhanced when youth feel their identity is respected and they belong to a group (Pat-Horenczyk, Brom, & Vogel, 2014).

Caretakers provide support, serve as role models in positive and negative coping strategies, and can contribute to the psychological symptom levels and well-being of children (Compas, Orosan, & Grant, 1993). Parental stress may be a significant predictor of children's mental health outcomes following traumatic exposure and children's responses to stress (Norris, Friedman, & Watson, 2002; Pfefferbaum, Jacobs, Houston, & Griffin, 2015). Youth often rely on parents to interpret the severity of stressful situations. For example, parental distress was directly related to child stress among survivors of Hurricane Katrina (Allen & Rosse, 1998). High levels of familial support has been associated with lower levels avoidance coping in response to trauma (Bal, Crombez, Van Oost, & Debourdeaudhuij, 2003) and family resources and social support have been associated with increased use of cognitive coping strategies (L. F. Farhood, 1999). Community contexts and relationships can also influence children's reactions to traumatic stress. Community experiences of violence can change normative beliefs fundamental to a child's worldview and normalization of violence can lead to more aggressive behavior (Barkin, Kreiter, & DuRant, 2001).

Systems perspective of resilience

More recent resilience research has built upon recognition of relationships in multiple systems and understanding those systems within an overarching socio cultural context. Understanding adaptive behaviors is context dependent, and, "what is adaptive in one context or during one developmental period may be maladaptive during another" (Theron et al., 2013; Ungar et al., 2013). Defining positive adaptations or negative adaptions requires a set of assumptions about perceived desirability of that adaptation (Masten, 2001). Researchers caution against relying on normative judgments derived from western culture (Ungar et al., 2007). For example in African communities youth identified as resilient were described as being flexible and determined, well connected to community systems and respectful of community values and culture (Theron et al., 2013). A study in Rwanda found self-esteem, family unity and collective support defining components of resilience (Theresa S. Betancourt et al., 2011). Research in

Afghanistan found that culturally defined well-being included concepts of morality, family unity and honor (Eggerman & Panter-Brick, 2010).

Ungar 2008 defines resilience as necessarily tied to cultural context "resilience is both the capacity of individuals to navigate their way to the psychological, social, cultural and physical resources that sustain their well-being, and their capacity individually and collectively to negotiate for these resources to be provided and experienced in culturally meaningful ways" (Ungar, 2008). This is in line with Amartya Sen's empirical finding in Freedom as Development, that well-being is related to our capacity for meaningful action and ultimately this is influenced by and dependent on our relationship with others (Sen, 1999). In order to understand fully the concept of resilience, it is critical to understand what is normative in a particular socio-cultural context and how those norms shape culturally specific constructs of resilience.

Protective and Promotive Path Models

Resilience can be conceptualized as not only the absence of negative effects, but also the existence of positive effects. This is an important perspective because, mental health is not just the absence of disease, rather, mental health also includes wellness, or well-being (World Health Organization, 1946). Well-being can be defined as, "a state of being with others and the natural environment that arises where human needs are met, where individuals and groups can act meaningful to pursue their goals and where they are satisfied with their way of life" (Armitage et al., 2012). Functional capacity should be considered in addition to psychological distress because in some contexts of political conflict, researchers have found youth are able to function despite having psychological symptoms (B. K. Barber, 2013; Boothby et al., 2006), whereas in others functionality may be limited (Veling, Hall, & Joosse, 2013).

To capture this concept, Patel and Goodman 2007, argue for differentiation between protective and promotive factors, whereby protective factors decrease the likelihood of mental health symptoms and promotive factors increase psychosocial well-being (Patel & Goodman,

2007). Thus, outcomes can be influenced through promotive or protective mechanisms. Protective factors moderate the negative effects of risk and result in lower PTSD, depression, anxiety, and aggression (Tol et al., 2013). Promotive factors are those that can increase prosocial behavior, self-esteem and functioning. It is important to distinguish between protective and promotive mechanism because children may continue to display psychological distress but still be able to function adequately (Olsson et al., 2003). While research has identified the importance of investigating protective and promotive processes, little is known about the extent to which protective and promotive processes are independent or whether processes have reciprocal relationships. For example, Zimmerman et al, (2013) argues that protective factors may also simultaneously enhance promotive factors while they protect against risk (Zimmerman et al., 2013). Understanding how processes function and result in mental health outcomes has important intervention implications.

There is a lack of consensus on how best to model protective and promotive factors. In a study by Kidd and Shahar, protective refers to ameliorative effects involving interactions between risk and factors whereas other research has used main effect models to distinguish high functioning children from low functioning children (Luthar, 1993). Interactive models statistically test interaction effects to identify moderating mechanisms between risk and adjustment. The merits of main effect models are that they answer the question, "among high risk children, what distinguishes those who do well from those who do poorly?" In contrast, interaction models pertain to specific moderating processes, asking "which attributes are associated differentially by level of risk?"

In order to fully understand resilience in children it is important to distinguish between mediating and moderating processes that result in mental health and well-being outcomes. Mediating variables identify why and how treatments have effects, conceptually different from moderators which seek to identify for whom and under what circumstances a treatment has an

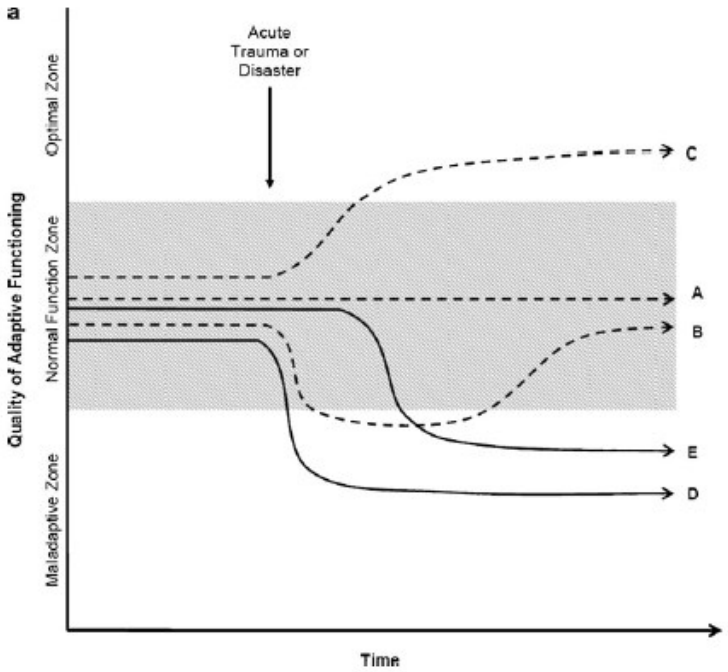
effect (Tol, Reis, Susanty, & de Jong, 2010). In this way, for example with regard to protective processes, moderators represent pathways in which a variable (i.e. age) is associated with smaller associations between trauma exposure and negative mental health outcomes. Mediating processes represent relations in which trauma exposure leads to a change in a variable (i.e. in coping style, a re-evaluation of what is important in life) that is related directly to lower levels of psychological symptoms or higher levels of well-being. Selecting the appropriate modeling method is key to uncovering the complexity of resilient responses to adversity.

Resilience Trajectories

Rutter, 2006 argues that in some circumstances experience of adversity may strengthen resistance to later stress (Rutter, 2006). Researchers have coined the term, the "steeling" effect to describe the strengthening effect that exposure to stresses may have over time through sensitization or by means of acquisition of assets from the previous experience (Rutter, 2012). Longitudinally, protective processes can act as a buffer to future disorder or dysfunction while promotive processes can develop assets that support healthy responses to adversity (Kia-Keating et al., 2011). A process based approach allows resilience to be viewed both as a process of overcoming adversity and as a result (outcome) of adversity. Outcomes from these processes continuously feedback into an individual's personal assets to combat the next exposure to adversity or conversely could weaken coping capacity resulting in greater vulnerability. Olsson, 2003 argues that similar to research that shows increasing the number of risk factors causes exponentially poorer outcomes (Fergusson & Lynskey, 1996), resilience factors may also have a chain reaction increasing coping capacity synergistically over time (Olsson et al., 2003). In this way, resilience is not a static state but instead necessarily contains ontogenetic fluctuations (Cicchetti & Lynch, 1993). Thus, many researchers have called for research which examines resilience from a life course perspective from the earliest days of life to well-being in later years (Patel & Goodman, 2007).

Though limited, longitudinal resilience research seeks to identify resilience trajectories over time to better understand psychological and well-being outcomes. Models of resilience can be linear and nonlinear, varying by levels of adversity. For example, curvilinear effects might exist where adaptation increased at low levels of risk and then falls at higher levels of risk creating an inverted U relation between adaptation and risk (Masten, 2013). Masten and Narayan outline conceptual trajectories of child resilience over time (Masten & Narayan, 2012). Figure 1 illustrates pathways of adaptive function before and after an acute traumatic experience. In Figure 2, resilience trajectories are in response to a prolonged and severe adversity such as that found in protracted complex emergencies.

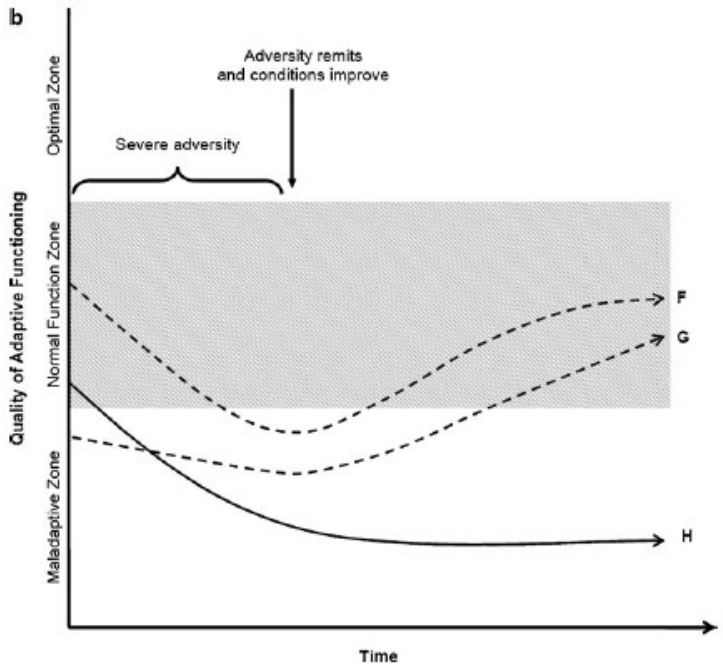
Figure 1. Resilience Trajectories following acute trauma exposure



The dashed lines represent paths of resilience and the solid lines represent maladaptive paths. The authors categorize the different trajectories with Path A representing stress resistance, Path B representing disturbance with recovery, Path C representing post-traumatic growth, Path D representing breakdown without recovery (yet) and path E representing delayed breakdown without recovery.

(Masten & Narayan, 2012)

Figure 2. Resilience trajectories following exposure to prolonged and severe adversity



Paths F and G represent decline in functioning in the context of adversity and then recovery afterwards to restorative function. Path H illustrates a decline in functioning with no state of recovery despite more favorable conditions.

(Masten & Narayan, 2012)

Multilevel Models of Resilience

Addressing a range of resilience promoting and protecting processes would allow key research questions about the processes of child resilience to be addressed (Olsson et al., 2003). For example a study with Colombian child soldiers found similarities among the most 'resilient children' including a sense of agency, social intelligence, empathy, community connection, sense of future hope and growth and a connection to spirituality (Cortes & Buchanan, 2007). Haroz et al, found engaging in prosocial behaviors was associated with improvement in anxiety and depression among conflict affected children in Uganda (Haroz et al., 2013). Individual level factors that have been researched include temperament, sociability, intelligence, academic achievement communication skills, and personal attributes such as hopefulness and self -esteem (Kidd & Shahar, 2008; Olsson et al., 2003; Rutter, 1987).

Family Level Factors

Family level factors include family cohesion, close relationships with caretakers, extended family support and marital support (Dybdahl, 2001; S. Qouta et al., 2008; Sujoldžić, Peternel, Kulenović, & Terzić, 2006). Family support can be defined as the degree to which youth are connected to family, participate in the family, and view family as supportive. Particularly for children, the functional status of families before, during, and after conflict is critical to child well-being as children are highly receptive to distress of parents (Masten & Narayan, 2012). Conflict can directly and indirectly threaten family support systems. Loss of family members, discontinuity of parenting norms, and forced displacement are just some of the ways conflict impacts family units.

Relationships with adults are critical for children coping and recovering from experiences of armed conflict. A depth of research indicates that a caretaking relationship with at least one adult results in better mental health outcomes (T. S. Betancourt & Khan, 2008; Emmy E. Werner, 1989; Zimmerman et al., 2013). Family systems can promote or harm adaptive capacity in children. For example, Sameroff, 2006 found that high maternal anxiety, few positive maternal interactions, single parenthood, and large family size were all risks to social-emotional resilience (Sameroff & Rosenblum, 2006). In Uganda, Annan and Blattman 2011 found that youth with higher family connectedness and social support had lower levels of psychological distress and better social functioning (Annan, Blattman, Mazurana, & Carlson, 2011). In Palestine, Quota et al, found that strong family relationships were important in predicting resilience among children and acted as a moderator, protecting against aggressive behavior (S. Qouta et al., 2008). Other research has described parental mental health as mediating the relationship of stress on children's mental health (Dybdahl, 2001; Harel-Fisch et al., 2010; Leinonen, Solantaus, & Punamaki, 2003; Locke, Southwick, McCloskey, & Fernandez-Esquer, 1996; Panter-Brick, Grimon, & Eggerman, 2013; A. A. Thabet, Ibraheem, Shivram, Winter, &

Vostanis, 2009). Among Bosnian youth, family connectedness was associated with reduced depression, but did not have an effect on anxiety (Sujoldžić et al., 2006).

Social and Community Level Factors

Social and community level factors include school experiences with peers and teachers, belief in values of society and supportive communities (Bonanno, 2008; Klasen et al., 2010; Olsson et al., 2003; Emmy E. Werner, 2012). Communities provide critical systems of social support for children including functional schools, safe places to play and cultural activities (T. S. Betancourt & Khan, 2008; Borucka & Ostaszewski, 2008; Masten & Osofsky, 2010). Social support systems provide opportunities to communicate and interact with peers, families, teachers and community members. Social disorder can result in disruption of mechanisms in the community that enforce positive behavior and cultural values. Research has found that belonging to community groups, being connected socially and being supported by social institutions leads to better mental health outcomes (L. Farhood et al., 1993; L. F. Farhood, 1999).

Among war-affected youth, social support systems may be integral to supporting better mental health in children. War results in a loss of security and structure in daily life and for children, restoration of a healthy social ecology is fundamental for promoting resilient outcomes (T. S. Betancourt & Khan, 2008). Among war affected children in Kosovo, family, social and community resources impacted psychosocial well-being (Barath, 2002). Connectedness with schools was associated with improved prosocial attitudes in child soldiers from Sierra Leone (T. S. Betancourt et al., 2010) and was associated with less depression and anxiety among Bosnian youth (Sujoldžić et al., 2006). Studies among South African youth also showed that cultural affiliations contribute to resilience processes (Theron, 2012). Other studies have found the that relationships with belief systems and religion can be protective against behavioral problems (Lee,

Kwong, Cheung, Ungar, & Cheung, 2010), depression and anxiety (Sujoldžić et al., 2006). Betancourt, 2010 found that increased community acceptance and social support was associated with both externalizing problems as well as prosocial behaviors (T. S. Betancourt et al., 2010).

There may be differences by gender in ways social support systems moderate risk. Kuterovac-Jaodic found higher levels of social support among girls and younger children and that poor social support predicted PTSD symptoms (Kuterovac-Jagodic, 2003). Among Kuwaiti girls and boys after the Gulf War, Llabre and Hadi 1997 found that social support moderated the impact of trauma on distress in girls but not in boys (Hadi & Llabre, 1998). In contrast, Brajsa-Zganec found that for both girls and boys, perceived social support is related to fewer depressive symptoms (Brajsa-Zganec, 2005).

Theoretical Frameworks

Metatheory

Most resilience theories recognize resilience as a dynamic process that changes over time and with relationships to the wider social ecological context. Building on the focus of dynamic processes in resilience research, more recent definitions have approached resilience from a systems perspective, "the capacity of a dynamic system to adapt successfully to disturbances that threaten system function, viability or development"(Masten, 2011, 2013). Individual difference in resilience trajectories over time is due to variation in risks as well as mediators and moderators that protect against risk over time. Individual development is necessarily tied to changing relationships with individuals and networks of social and cultural systems (Masten, 2004). Theoretical frameworks of human development have evolved from psychological or biological approach to studying the life span to a multidisciplinary approach that seeks to integrate variables from biological, social, cultural and even historical levels of organization in to a "synthetic, co-actionable system" (R. M. Lerner, 2006). The broad theoretical framework for

resilience research with children draws on principles of developmental psychopathology (Masten & Obradovic, 2008) developmental systems theory (R. M. Lerner, 2006) and the ecological model of development (Bronfenbrenner, 1979).

Developmental Systems Theory

Developmental systems theory has roots in developmental child psychopathology. This theoretical framework followed the paradigm shift in research to focus on processes and assets at the individual level, and an integrative approach to understanding variation in human adaptation (Masten, 2013; Sameroff, 2000; Wachs & Rahman, 2013). Developmental systems theory posits that each individual has a *reciprocal* relationship with his or her context and that this relationship is plastic across the life course (R. M. Lerner, 2006; Richard M. Lerner et al., 2012; Overton, 2013). A developmental psychopathology perspective on resilience argues that there exists "multifinality" in developmental processes, that is, individual responses to risk interact with other factors over time and explain diversity in development outcomes (Cicchetti & Lynch, 1993). These processes are influenced by factors that are internal to the individual (including biologic and genetic factors) and external (including timing of adverse events, social context, and history). In this way, resilience can be described as, "a multiply determined developmental process that is not fixed or immutable" (Cicchetti, 2013). In sum, a developmental systems perspective views individual adaptive capacity as reflective of relations between individuals and their contexts and these relations are defined by ontogenetic change within a dynamic developmental system over the life course (R. M. Lerner, 2006). This perspective supports conceptual models that are change sensitive and develop longitudinally over time.

Social Ecological Model

Bronfenbrenner put forth the social ecological model of child development in 1979 and provided a landmark framework for understanding child development (Bronfenbrenner, 1979).

Bronfenbrenner's model stressed the importance of interactions with multiple levels within an individual's context and in this way, defined development as interactions with different systems. The microsystem includes factors related to the child (personality, IQ) and the child's immediate context (peers, schools and church)(Ungar et al., 2013). The mesosystem involves interaction of two or more settings, for example 'family and school' or 'church and friends' (Bronfenbrenner, 1979). The mesosystem is important because it provides an opportunity to share resources and provide optimal support for the child (Ungar et al., 2013). The exosystem shapes the mesosytem and microsystem processes and includes more distal social institutions, structures and support systems such as health care systems and primary education. The exosystem is important to global health research because many humanitarian (particularly 'psychosocial') interventions target the exosystem (improving health care delivery, education, livelihood opportunities) with the belief that improvements in the ecosystem will translate to improvements in meso and microsystem functioning and lead to sustainable gains. The highest level, the macrosystem refers to the larger cultural context including beliefs, customs, history and politics (T. S. Betancourt & Khan, 2008; Bronfenbrenner, 1979). While it is difficult to quantify and isolate the impact of the macrosystem, researchers argue that there exists a connection between values, collective beliefs and child mental health (Ungar et al., 2013). For example, Betancourt (2010) demonstrated that post-conflict values such as community acceptance of former child soldiers and social structures in the community resulted in better child mental health outcomes (T. S. Betancourt et al., 2010). Qualitative research among refugees from Sudan found belief in God to be a primary coping behavior used by refugees who sought comfort in prayer and also discussed that church provided a social, information and material support system (Schweitzer, Greenslade, & Kagee, 2007). Utilizing Brofenbrenner's ecological model in the context of resilience supports a focus on the processes that result in better resilience outcomes and the interconnections and interactions among multiple levels within the social and ecological system.

Complex Adaptive Systems

Advances to the theory of resilience have moved from nested conceptualizations to more chaotic models that include changing and temporal relationships in risk factors, adaptive behavior, as well as factors related to changes in the wider social, cultural, political and economic environment. In this way, Masten, 2013 argues, "the resilience of an individual over the course of development depends on the function of complex adaptive systems that are continually interacting and transforming. As a result, the resilience of a person is always changing and the capacity for adaption of an individual will be distributed across interacting systems" (Masten, 2013). From a complex systems perspective each element is both a whole and an incomplete expression of another element (Ungar et al., 2013). This perspective builds on previous frameworks by stressing the multitude of mediating processes adapting over time. Applied to situations of armed conflict, a complex adaptive systems perspective underscores the importance of interdependence between individual, family and community systems. Masten et.al, 2012 suggests that, "traumatic experiences, "can spread over time, from one domain to another, from one level to another, from one person to another, and from one generation to the next, through a multitude of mediating processes" (Masten & Narayan, 2012). In addition, the complex adaptive systems perspective is less hierarchical in its interpretation of systems than Bronfennbrenner's model to account for the complexity of reciprocal relationships. Furthermore, Ungar et.al, 2013 argues that interactions across levels are complex without an exact boundary and with no level being more important than another (Ungar et al., 2013). Others have stressed that complex systems captures the intelligent trade off negotiations between capacity to cope and other types of variability in order to cope better to future stressors (Janssen, Anderies, & Ostrom, 2007). For example, girls may engage in aggressive behavior that at first may seem maladaptive, but in reality could be a response to threats of sexual and gender based violence. The complex adaptive systems framework applied to resilience views resilience

outcomes as the product of a constellation of factors, with that constellation changing over the life course.

Conceptual Model

Exposure to trauma affects more than individuals, exposure to trauma can affect multiple levels within a sociocultural system including the peer, family and community levels. Rather than separating factors related to individual family, school and culture as exogenously affecting the model, this model views these factors as mediators within the path from risk to resilience. In this model, youth resilience includes multiple interrelated systems and individual, family and community level systems have reciprocal relationships with one another. Resilience research must simultaneously look at promotive paths to positive outcomes and asset building as well as protective paths against psychological symptoms. This will be useful in developing strategies that address both mental health promotion and protection from psychopathology. To reflect that systems change over time, a feedback loop from outcomes to exposure indicates that the processes that result in mental health and well-being can have effects on future exposure to trauma and the mediating processes that result in future outcomes. A challenge to resilience models is how best to capture the constellations of relationships between individual, family, social and cultural factors that characterize resilience. While this model is two dimensional, one could imagine the different mediators interacting with risk and outcomes in a matrix, forming a constellation of relationships that changes over time.

Figure 3. Conceptual Model of Resilience Processes in a Conflict-Affected Community

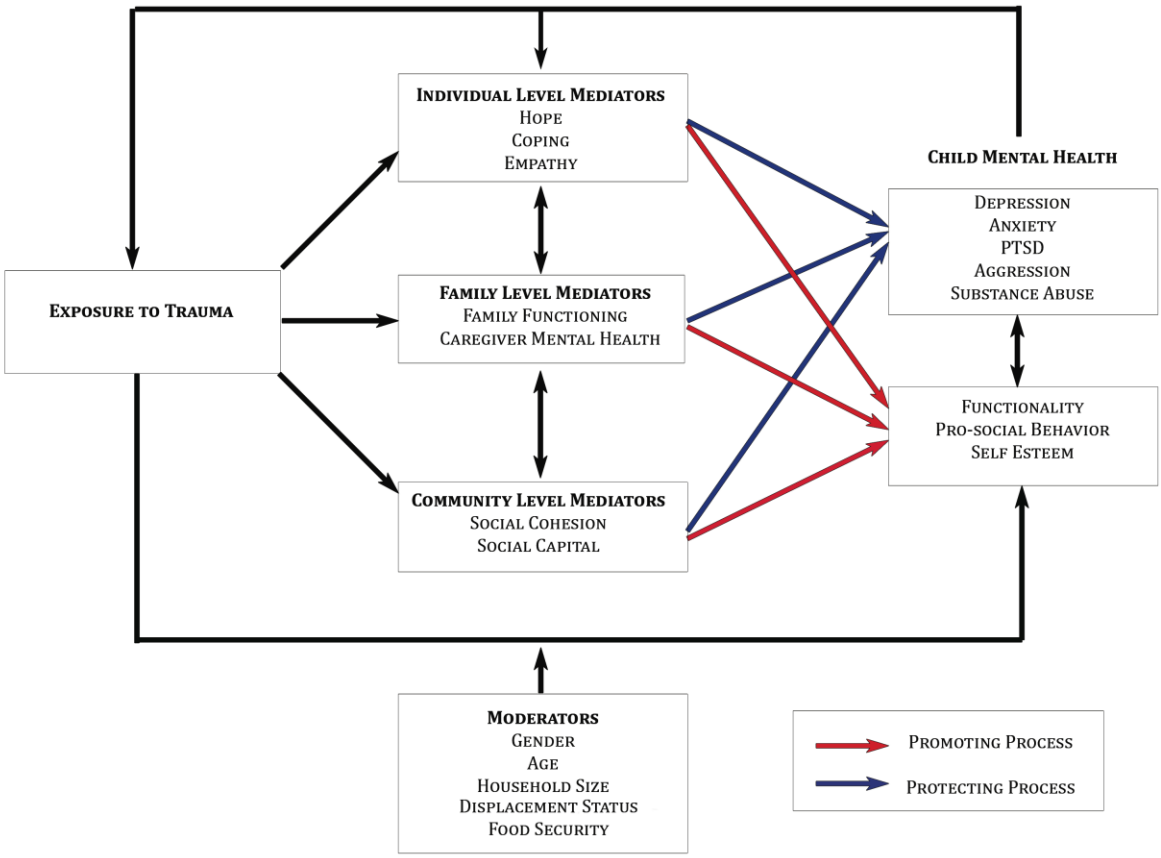
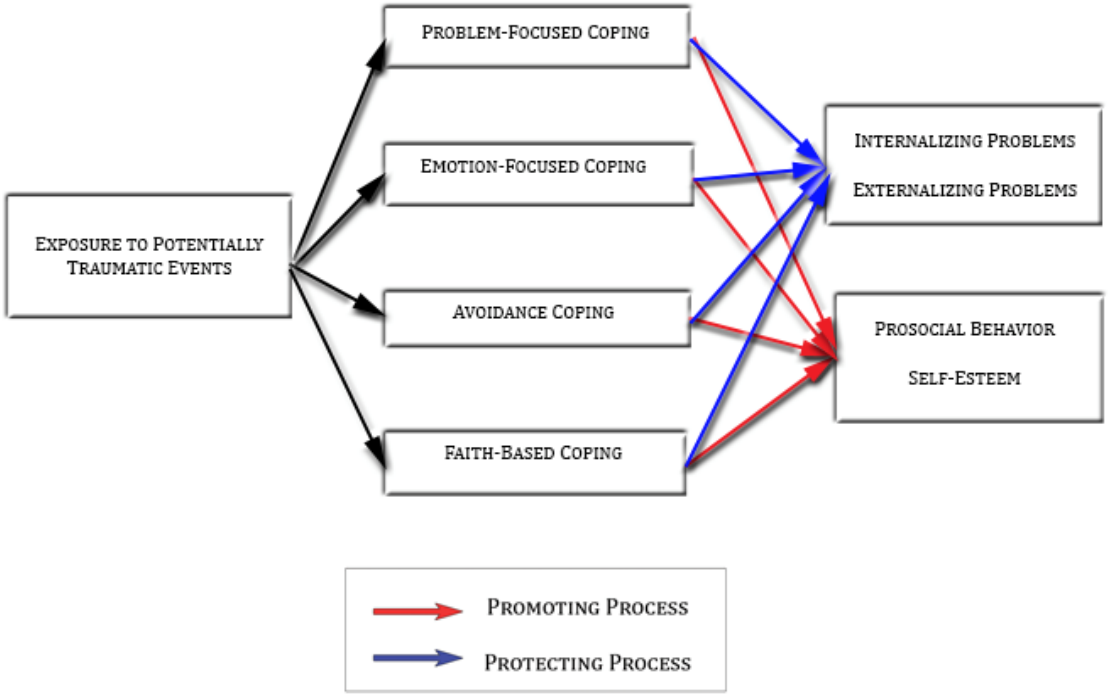


Figure 4. Conceptual Model of Coping and Mental Health for Youth in the DRC



Thesis Research

The Rabbits for Resilience (R4R) Project

Research Team

The Rabbits for Resilience research team includes research partners in three US based institutions and one DRC based NGO (N. Glass, Ramazani, Tosha, Mpanano, & Cinyabuguma, 2012). The US based institutions include Great Lakes Africa Restoration, Johns Hopkins School of Nursing and Public Health and Kaiser Center for Health Research. The DRC based partner is Programme d'Appui aux Initiatves Economiques du Kivu (PAIDEK). PAIDEK was founded to support the development of the economy in Eastern DRC. Dr. Nancy Glass is the Primary Investigator on the grant.

Youth Led Microfinance Intervention

Rabbits for Resilience (R4R) is a youth-led microfinance intervention. It is a youth version of a previously implemented intervention Pigs for Peace (P4P), and adult led microfinance intervention. R4R educates village leaders and members and invites their participation. If a village agrees to join households with youth ages 10-15 are invited to participate. Rabbits are regularly eaten and sold in villages in eastern DRC and are appropriate for youth to breed. Youth who participate in R4R form a youth association that meets weekly to discuss challenges and solutions related to the program and are also a space to promote peer relationships and social capital. Youth members decide which members receive the rabbit loan. Those youth agree to repay the rabbit loan to the youth association by giving one rabbit from their first litter (2-6 on average). Repaid rabbits are given to other youth association members. A local farmer is available to mentor youth on managing the rabbit loan including building rabbit enclosures, veterinary services and food and health of rabbits. Money received from sale of

rabbits have been used to purchase school uniforms, notebooks and other activities. The aim of the intervention is that by providing empathy, hope and caregiving as well as opportunities for promoting prosocial behavior and social networks, youth will have better resilience outcomes.

Study Setting

In the Democratic Republic of Congo it is believed that 30,000 children are child soldiers with armed groups (McMullen et al., 2013). A recent study in the eastern part of the country found that 95% of youth reported at least one traumatic event; and on average, adolescents were exposed to 4.7 traumatic events; and 52% of adolescents met the criteria for PTSD (Mels et al., 2009). Violence, population displacement and the destruction of health and educational institutions have weakened the systems required to treat children's mental health problems and promote their well-being.

This study took place in ten villages in the Walungu territory in South Kivu province, Eastern Democratic Republic of Congo. This territory is 50km south of Bukavu, the capital of South Kivu and has been afflicted by war since 1999. The Walungu territory has an estimated population of 700,000 with each participating village having populations between 75-350 households. The people living in these rural villages have experienced significant violence, displacement and trauma over the past 20 years with limited health care, schools or governmental or non-governmental organizations to provide support and resources.

This rural territory was selected for implementation of the pigs for peace (PFP) and rabbits for resilience (RFR) intervention because of the significant impact of war on these villages, the limited humanitarian or development resources that have reached these villages and the strong history of collaboration with Congolese physicians, agriculture technicians, community health workers, religious leaders and village leaders in this territory.

Study Design

This qualitative study uses the research infrastructure of a larger National Institute of Health (NIH)/National Institute of Child Health and Human Development (NICHD) funded randomized community trial of a youth-led livestock microfinance program, Rabbits for Resilience (RFR). RFR is a collaborative project between Programme d'Appui aux Inititatives Economiques (PAIDEK), an established Congolese microfinance institute, and Johns Hopkins University School of Nursing (JHUSON). RFR is designed to increase youth and family resilience to ultimately improve health and emotional adjustment after exposure to adversity and trauma. RFR includes male and female youth ages 10-15 years living in 10 rural villages in the Walungu territory in Eastern Democratic Republic of Congo. The ten villages included in the impact evaluation of RFR were selected for several reasons including; (1) feasibility of delivering an intervention over a wide geographical area; (2) commitment to the intervention and study by traditional chiefs and administrators; and (3) findings from village-level assessments that showed few health and development programs exist in the area, including microfinance. RFR and PFP are pragmatic community trials to test the effectiveness of youth-led rabbit animal husbandry microfinance program combined with an adult pig animal microfinance program aimed at improving health, economic stability and relationships between families and communities through loans of pigs (N. Glass, Perrin, Kohli, & Remy, 2014). Within each of the ten villages, a minimum of 20 households were invited to participate. Within each household only one youth was randomly selected (stratified by gender) to complete data collection. In total 434 youth participated in the study at 6-month follow up.

IRB and Ethical Considerations

The Johns Hopkins School of Medicine Institutional Review Board (IRB) approved this study (IRB: CIR00001977; Date: 06-23-14). A committee of respected Congolese educators at

the Universite Catholique at Bukavu reviewed and approved this study as there is no local institutional review board in South Kivu. The research team received approval to conduct the research with local partners PAIDEK by village traditional and administrative leaders. All research team members successfully completed research training on responsible conduct of research using the on-line Collaborative Institutional Training Initiative prior to their involvement in the study. Parents/caregivers of eligible youth were provided with the purpose of the study, risks and benefits of participation in the study and then were asked to provide verbal informed consent for their child to participate. If a parent/caregiver consented, their child was then asked for verbal assent after receiving details on the purpose of the study and prior to beginning the interview. No participants' names were recorded, all interviews were conducted in private and no information was shared outside the research team. All risk to human subjects will be handled by the R4R human risk and protection protocol in the Appendix F.

Data Collection and Analysis Methods

Qualitative Research methods

Theoretical Perspective

In order to understand youth participant exposure to violence and other traumatic events and their cognitive and behavioral coping strategies, a grounded theory approach was used in the initial coding of the data and deductive reasoning used to explore how emergent themes relate to existing theory (Charmaz, 2006). The grounded theory methodological approach is grounded in the constructivist epistemology, that meaning is co-created in the discourse between people. Grounded theory supports the role of subjectivity in creation of meaning. Moreover, gaining knowledge through discourse is necessarily grounded in a particular

social and historical *context*. For this study a grounded theory perspective is valuable because of the implicit focus on taking Congolese youth comments as true representations of their perspective on trauma and coping. Second, a deductive process was used whereby emergent themes were categorized based on existing theory suggesting two coping domains, cognitive and behavioral coping strategies. This study utilizes in depth interviews and relies on the dialogue between interviewer and interviewee to construct an improved understanding of ways youth cope with stress.

Qualitative Sample

A purposive sampling strategy was used to identify eligible youth enrolled in the parent study. Youth were selected from four of the 10 study villages, Karherwa, Cagombe, Izege and Kaniola. These villages were selected because of the reported high exposure to conflict-related trauma. Within these villages, baseline data from the parent study was used for purposive sampling based on age, gender and exposure to traumatic events to identify 48 youth (12 from each village). Traumatic exposures were represented by a wide range of experiences including murder of family/friends, having ill health without care, lacking food and water, being seriously injured, being close to death, separation from family, experiences in combat and brainwashing. Specifically, youth were selected for variation on experience of trauma: low exposure to trauma (0-1 events), medium exposure (2-3 events) and high exposure (4 or more events). Within each trauma exposure level purposive sampling involved achieving a balanced distribution of participants by age (10-12 and 13-15) and gender. Of the 48 eligible participants identified, 30 youth completed the interview (16 were not found on the day of interview).

Congolese Research Team and Development of the Youth Interview Guide

Congolese research team members were previously trained by the parent study team and had successfully completed qualitative and quantitative research in the study villages. Congolese

interviewers actively participated in the design, development, piloting and revision of the youth interview guide. The research team reviewed and revised interview questions to ensure questions were culturally relevant and would be appropriate for ages 10-15. The questionnaire used for interviews with you was translated by the Congolese research team into local languages, Swahili and Mashi. Probes were developed with local partners to capture greater depth in participant responses. The interview guide was piloted in June 2014 among 5 youth in the microfinance demonstration project site located in a village outside of Bukavu, the capital city of South Kivu province. Following the pilot test, the research team revised the interview guide and conducted a second pilot test among 5 different youth. Revisions included the removal of redundant questions to shorten length, rewording of questions found to be confusing or unclear and minor re-ordering of questions to promote improved flow of the instrument as a whole. The final guide consisted of broad open-ended questions related to the following topics, 1) identification of trauma-related experiences, 2) methods for coping and changes in coping behavior 3) respondent's perception of gender and age differences in coping, 4) sources of psychosocial support. After final revisions to the interview guide, the researcher commenced two day team training in administration of consent (in alignment with IRB regulations), ethics, and qualitative interview methods.

Data Collection and Procedures

The Johns Hopkins School of Medicine Institutional Review Board (IRB) approved this study (IRB: CIR00001977; Date: 06-23-14). The research team also received approval to conduct the research with local partners PAIDEK by village traditional and administrative leaders. Parents/caregivers of eligible youth were provided with the purpose of the study, risks and benefits of participation in the study and then were asked to provide verbal informed consent for their child to participate. If a parent/caregiver consents, their child was then asked for verbal assent after receiving details on the purpose of the study and prior to beginning the

interview. No participants' names were recorded, all interviews were conducted in private and no information was shared outside the research team.

After parents/caregivers provided informed consent and youth provided assent, the interviewer selected a location for the interview away from parents/caregivers and friends that would allow for privacy and disclosure during the interview. The interviewers started with asking youth participants to describe their typical day, their family, their community and activities they participate in. Initial questions allowed the interviewer to develop a level of rapport with the youth where they would feel comfortable answering more personal questions. The interviewer utilized probes to explore topics related to coping strategies, trauma and family and community relationships in greater depth. The final interview guide resulted in interviews between 30 and 60 minutes in length. All participant answers were recorded verbatim and participants were provided with compensation for their time equal to 2USD.

Qualitative Analysis

After completion of interviews, a Congolese translator completed translation of all transcripts from French or the local language (Swahili or Mashi) to English. The translations were cross-checked by researchers based in the US and in consultation with the Congolese research team. After completion of the translation and review, the analysis used a grounded theory approach, which is rooted in a participatory transformative paradigm (Charmaz, 2006; Mertens, 2009). First initial codes were developed through line-by-line coding of a sub-sample of interviews (interviews of 5 girls and 5 boys). *Line-by-line* coding involves providing a code to each line of written data and allows for ideas to emerge that may have escaped attention if reading for a general thematic analysis (Charmaz, 2006). Line-by-line coding allows the researcher to identify implicit actions and meanings, identify gaps in the data and to note common relationships and significance between codes. Where appropriate, codes were left *in vivo*, to preserve participants' language and meaning. In vivo codes are locally defined terms that

condense meaning and are characteristic of societies and reflect assumptions, actions and imperatives (Charmaz, 2006). The next analysis phase was the development of *focused codes* that were applied to all interviews. Focused codes are developed from using the most significant and/or frequent initial codes to make analytic sense of the data. Next, *axial coding* was used to represent the content of focused codes and to relate common codes, categories and concepts to each other. Second, a deductive process was used whereby emergent themes were categorized based on application of existing theory suggesting two coping domains, cognitive and behavioral coping strategies. Final coding structure was applied to each transcript using Atlas Ti software.

During the application of focused and axial coding, memos were written by the researchers to help identify emergent themes related to youth coping styles. Memos allow the researcher to capture comparisons and connections and to construct analytic notes (Charmaz, 2006). Iterative inductive content analysis was used to identify emergent themes and connections between themes (Creswell & Zhang, 2009). Verbatim statements that capture emergent themes were identified for use as quotes.

Quantitative Research Methods

Study Procedures and Sample

Ten rural villages of the Walungu Territory were selected for participation in this study and were determined by the operational feasibility, local commitment from the village chief and village-level assessments. Within each village households were invited to participate based on if they met established PFP criteria (resident of village, youth in target age (10-15) group, interest in animal husbandry, vulnerable children and families). Youth ages 10-15 were eligible for participation. Only one youth per household was selected at random (stratified by gender) and enrolled to complete data collection. This current analysis is limited to data collected at six

month follow up from the Rabbits for Resilience survey. The final sample included 434 youth, 224 girls (48.4%) and 210 (51.6%) boys.

Data Collection

Parents/caregivers of eligible youth were provided with the purpose of the study, risks and benefits of participation in the study and then were asked to provide verbal informed consent for their child to participate. If a parent/caregiver consented, their child was asked for verbal assent after receiving a description on the purpose of the study and prior to beginning the interview. Participants' names were recorded separately from the interview questions and secured, all interviews were conducted in private and no information was shared outside the research team.

Experience during pilot tests with the survey instrument and prior experience working in these communities indicate that youth felt comfortable being interviewed by male and female team members (N. Glass et al., 2014; A. Kohli et al., 2015) The survey instrument was developed from existing, validated assessment tools and findings from the teams prior research, as described below, and administered electronically using a designed HTML5 survey application on tablet computers (iPad) using the iOS mobile platform (Apple Inc., Cupertino CA) to ensure consistency and to allow for data to be securely stored in a password protected file on a server. All interviews were conducted by Congolese researchers fluent in French, Swahili and a local language, Mashi. Participants selected the language they preferred for the interview. Interviews were conducted in a private setting and ranged from 45- 90 minutes. All participants were provided with compensation for their time equal to 2USD, an amount considered appropriate after consultation with village leaders and research team members.

Quantitative Survey Measures

The Harvard Trauma Questionnaire was adapted to measure youth trauma exposure (Richard F Mollica, 2004). The scale measures a variety of stressors experienced in an individual's lifetime. Exposure to trauma was analyzed as a continuous variable (0-18 total

traumatic events) and categorically. Traumatic events assessed fell within five categories (1) material deprivation (three events: lack of food or water, lack of shelter, and ill health without access to medical care); (2) warlike conditions (one event: combat situation); (3) bodily injury (four events: torture, serious injury, rape or sexual assault, other type of sexual humiliation); (4) coercion (six events: imprisonment, brainwashing, lost or kidnapped, being close to death, forced isolation, forced separation from family members); and (5) violence to others (four events: unnatural death of family member or friend, murder of family member or friend, murder of stranger, witness rape or sexual abuse) (R. F. Mollica et al., 1993)

The KidCope Checklist was adapted to measure coping among youth and was originally developed by Spirito et.al (1988) (Spirito, Stark, & Williams, 1988). The KidCope version used was designed for ages 7-12 and is scale derived from yes/no questions on coping strategy use. The second part asks about youth perceptions of if the behavior helped ("not at all," "a little" and "a lot"). The original KidCope includes 15 items designed to assess ten coping strategies: social withdrawal, distraction, wishful thinking, cognitive restructuring, social support, problem-solving, self-criticism, emotional regulation, resignation and blaming others. Prior to collecting quantitative data on coping strategies, qualitative research was conducted in mid-2014 and the scale was adapted to the context and to improve cultural relevance (Cherewick et al., 2015). One item, "I slept to feel better" was added to the scale to represent the "resignation" strategy and an additional coping strategy. "I sang a song to feel better" was added to represent the "emotional regulation" strategy. "I prayed" was added to the scale as a coping strategy based on the qualitative study that indicated prayer was an extremely common response to coping with stress. Strategies represented by two items were coded positive for use if at least one of the two items was endorsed, a scoring method previously used with KidCope (Jeney-Gammon, Daugherty, Finch, Belter, & Foster, 1993). In administering the KidCope, a stressful event was identified by

each youth and they were asked to consider whether they used a series of coping strategies in response to the event.

The African Youth Psychological Assessment (AYPA) was used to measure internalizing (depression/anxiety) and externalizing problems (aggression/hostility) and prosocial attitudes/behaviors (Theresa S Betancourt, Yang, Bolton, & Normand, 2014). This scale was developed through item-response theory in multiple samples of youth in sub-Saharan Africa to assess emotional and behavioral problems, somatic symptoms and pro-social behavior and has demonstrated good psychometric properties. The scale has four response categories, none=0, sometimes=1, often=2 and constant=3 and mean scores are determined for each sub-dimension (internalizing problems, externalizing problems, somatic symptoms and prosocial behaviors). The internalizing problems subscale included items such as, "I feel sad", "I feel a lot of pain in my heart", "I sit with my cheek in my palm" and "I have a lot of worries". The externalizing problems subscale included items such as, "I insult friends", "I am disobedient" "I deceive" "I am a rough person" and "I use bad language." The prosocial attitudes and behavior subscale included items such as, "I cooperate with others, "I play together with others", "I help others", and "I share food and eat with others". All subscales have been shown to have satisfactory reliability with Cronbach's alpha values of prosocial behaviors/attitudes (alpha=0.72), externalizing problems (alpha=0.83) and internalizing problems (alpha=0.88) (Theresa S Betancourt et al., 2014).

The Rosenberg Self-Esteem (RSE) Scale was used to measure self-esteem, defined as, "the degree to which he holds attitudes of acceptance or rejection toward himself" (Rosenberg, 1965). The RSE is ten item scale constructed from dichotomous variables with questions such as "On the whole, I am satisfied with myself", "I feel that I have a number of good qualities" and "I feel that I'm a person of worth, at least on an equal plane with others". The RSE has demonstrated excellent internal consistency (alpha=0.92) and test retest reliability with correlations of 0.85-0.88 (Rosenberg, 1965).

The Douchette and Bickman's Hopefulness Scale: Youth Version has demonstrated high reliability for youth ages 6-18 (alpha=0.82) (Doucette & Bickman, 2000). The scale has 10 items designed to assess children's levels of hopefulness in the last thirty days and each item is rated on a 3-point rating scale ranging from 1 (almost never), 2(sometimes) and 3 (often). Examples of items include in the scale are, "I was able to accomplish the things I wanted to do in my life", "there are people I counted on to help out if I needed" and " my life has been going well".

The Harvard Trauma Questionnaire for Parental PTSD PTSD symptoms in the past seven days were assessed using a sixteen item version of Section 4 of the HTQ (Richard F Mollica, 2004). This measure has been used to understand symptoms of PTSD among conflict-affected populations and have good psychometric properties (Roberts, Ocaka, Browne, Oyok, & Sondorp, 2008; Ventevogel et al., 2007). In this study the Cronbach's alpha for PTSD was 0.97. If less than 25% of the individual symptoms for the PTSD scale were missing for an individual, the symptom score was computed as the average of available items and if more than 25% of the symptoms were missing for an individual the symptom score for that individual was not computed (A. Kohli et al., 2015). After accounting for missing PTSD symptom data, the final sample for Parental PTSD included 399 parents out of the 434 youth included in this analysis. PTSD was included as a continuous covariate in all models.

Additional Variables Three variables measured belonging or closeness to friends, family and the community. The scale had four response choices; 1=very distant, 2=distant, 3=close, 4=very close. Home violence and village violence measured how safe or unsafe individuals felt in their home/village in the past six months with 1="unsafe" and 0="safe". School enrollment was another variable included as a dichotomous variable; 1=attend school 0=not enrolled in school. Happiness was measured with a single item, "In general how happy do you consider yourself to be"? Four answer choices were available 1=very unhappy up to 4=very happy. These variables

were included based on input from the Congolese research team and upon analysis of baseline data.

Factor Analysis and Hierarchical Regression Statistical Analysis

The current analysis is data collected at the six month follow up interviews from youth ages 10-15 enrolled in the Rabbits for Resilience (RFR) study. Data were analyzed using STATA Version 12 (Stata Corporation, College Station, TX). Prevalence of each type of coping strategy used was examined by gender and age. Item variance, skewness and inter-item correlations were examined prior to conducting factor analysis of the KidCope. Sample size was adequate for factor analysis considering common requirements of 5-10 subjects for every item analyzed as well as achieving high subject to item ratio (20:1) (Costello, 2009; Tinsley & Tinsley, 1987). Goodness-of-fit of the confirmatory factor analysis of a two factor solution were assessed using Bentler's Comparative Fit Index (CFI), the Tucker Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA) (Bentler, 1990; Steiger, 2000; Tucker & Lewis, 1973). CFI and TLI cutoff values should be greater than 0.95 and RMSEA close to 0.06 (Bentler, 1990).

Exploratory factor analysis was used to explore dimensionality of the KidCope scale to find the smallest number of interpretable factors needed to account for correlations among items. Tetrachoric correlations were used for the dichotomous scale items and iterative principal factor analysis was used to analyze the factor structure. Due to skewness of the binary data, factor analysis of Pearson correlation matrix is less appropriate than a matrix of tetrachoric correlations (Uebersax, 2000). The iterated principal factor estimation method uses initial estimates of communalities and iterates the solution to obtain better estimates. Due to correlations between factors, promax rotation was used to make the factors interpretable. The number of factors selected were identified based on conventional criteria: 1) Factors with eigenvalues>=1; 2) Scree plot 3) factor loadings greater than or equal to 0.35; 4) interpretation of the factor pattern, and 5) results from qualitative research in this context (Howell, Breivik, & Wilcox, 2007). Factor scores were used to predict the score of each

individual for the factor; this method maximizes the correlation of factor scores to the estimated factor (DiStefano, Zhu, & Mindrila, 2009) .

Simple linear regressions were used to assess whether trauma exposure, sex and age were associated with coping strategies. Hierarchical robust regression models were fitted to examine the association of coping behaviors on the dependent psychosocial variables: internalizing problems/attitudes and externalizing problems/attitudes; and well-being outcomes Well-being outcomes included prosocial behavior and self-esteem. We included sex, age, total trauma exposure at baseline and recent stress exposure as covariates in Model 1 for each outcome. Model 2 included coping strategies and Model 3 evaluated interaction effects of coping strategies.

Structural Equation Modeling Analysis

This analysis includes data collected at six month follow up interview with eligible youth in the Rabbits for Resilience microfinance intervention. All analyses were performed using Stata Version 12 (Stata Corporation, College Station, TX). The sample characteristics were described using frequencies and means by age and gender. Descriptive statistics were used to check for skewness and data non-normality.

Structural equation modeling (SEM) was used to test the relationship between total exposure to trauma, coping strategies, psychological health, well-being measures and external factors at the peer, family and community level. Each SEM was developed separately for boys and girls with age as a control variable. A structural equation model approach seeks to establish a theoretical ecological resilience model of how exposure to trauma affects coping mediators on paths to youth resilience outcomes. In contrast to regression, which seeks to explain the percentage of variance in the outcome measure, a structural equation model utilizes the covariance structure of variables and evaluates the model fit based on how well the model explains covariance of exogenous and endogenous variables.

For each model tested, 1) overall fit, 2) the significance of individual structural paths, and 3) amount of variability R^2 of the latent variables accounted for by observed variables were assessed.

Model fit was evaluated using goodness of fit indices including the chi-square (X2), root mean square error of approximation (RMSEA) (Steiger & Lind, 1980), the comparative fit index (CFI) (Bentler, 1990), the Tucker-Lewis Index (TLI) (Tucker & Lewis, 1973) and the standardized root mean residual (SRMR). A X^2 value of no more than twice the degrees of freedom indicates a well-fitting model (Bollen, 1989). The CFI and TLI compare the exiting model fit with a null model assuming uncorrelated variables (independence model). The RMSEA assesses overall fit but penalizes for less parsimonious models. The following statistical criteria was used to evaluate model fit: RMSEA <0.06; CFI >0.90, TLI >0.90, and SRMR <0.08 (Kline & Santor, 1999). To account for the cluster design (households clustered within 10 villages), robust cluster estimation was used. Modification indices were examined to improve the fit of the model according to theory and evidence from the correlation matrix (Kline & Santor, 1999).

Results and Discussion

1. Coping among trauma-affected youth: Results from a qualitative study

Sample demographics are shown in Table 2. Of the 48 eligible participants identified, 30 youth completed the interview, 53% were female (n=16) and (47%) were male (n=14). Youth ranged in age from 10-15 years old (mean age = 13.07) and were from the following villages, Cagombe (n=8) Izege (n=8) Karherwa (n=6) and Kaniola (n=8).

Table 2. Sample Demographics: Trauma Exposure, Gender and Age

	Girls		Boys		
Trauma Exposure	**Ages 10-12**	**Ages 13-15**	**Ages 10-12**	**Ages 13-15**	**Total**
Low (0-1 events)	1	2	1	1	5
Medium (2-3 events)	2	3	2	4	11
High (4+ events)	4	4	3	3	14
Total	7	9	6	8	30

Exposures to violence and stress

Investigating types of exposure to violence and other traumatic events that youth experienced was important to understand contextual variables that can affect coping and resulting mental health outcomes. On-going violence in rural villages in Eastern DRC continues to affect the health, economic and social well-being of rural villagers including youth. Youth participants in this study reported a range of traumatic experiences in their lifetime. Youth participating in this study were purposively selected because of report of prior trauma exposure. At baseline, youth completed a survey including the Harvard Trauma Questionnaire. Results from baseline were used to purposefully select youth with different levels of exposure. Almost half (46.7%) of the 30 children experienced 4 or more traumatic events, 36.7% reported 2-3 and 16.7% reported 1 or no traumatic events in their lifetime. Exposures to different forms of violence, such as witnessing the death of a friend or family member, being in a combat situation and forced separation from family and lack of basic needs, such as lack of medical care, lack of shelter, and lack of food were reported among youth participants. The qualitative analysis revealed that exposures to traumatic stressors occur at the individual, family and community level.

Individual Exposure to Violence

The majority of young adolescents interviewed had a personal story of loss and suffering. Participants described experiences of militia groups coming through their village. For example, a fifteen year old girl recollects her experiences with conflict-related violence,

> "In the past (2004), we were not sleeping in our houses. Our village was all the time attacked by FDRL (armed combatants) These soldiers terrorized, killed, and raped people, and plundered houses, if I had power, I would kick them out of my country. These crooks came very often, during the day or at night, and

> inflicted to people horrendous things. They came to our house, when I was 7, and grabbed our property, goats, clothes and other things."

Youth participants describe the intentions of armed groups intentions as primarily to plunder or steal items of value from homes. The memory of armed conflict is long lasting and difficult for many youth to forget. These events cause continued anxiety and fear that can be detrimental to mental health. For example, a fourteen year old male recounts,

> "What has already frightened me is the thought that the people who come here to kill others can also kill me as I am alone in the house. I am unable to help myself and stop this fear, and so I wish we had people to protect our village. Bandits have already killed a neighbor; I've been afraid since then. "

The effects of armed conflict continue influence youth lives. A ten year old female explains,

> "I'm afraid, when I hear gunshots and when people fight in the village, even though I may not know those people. I'm also afraid when I see blood, especially when mothers are nursing people who got wounded in fights. Usually such events upset me, and I usually hide in order not to see what's going on. One doesn't forget easily after they saw blood. Sometimes I even vomit."

Experiencing violence at the individual level may directly affect mental health and well-being outcomes or may be mediated by coping strategies.

Violence in the family

A common theme from nearly half of youth interviews was the experience of domestic violence, both witnessing violence between parents and experiences of being beaten. This is an

important finding because attachment relationships with parents/caregivers are critical for helping youth to cope with trauma and stress (Rutter, 1987). Family members can act as a protective factor or parents can limit youth coping if they themselves are unable to cope with their trauma (Elbedour, ten Bensel, & Bastien, 1993). A 12 year old female speaks about witnessing violence between her parents,

> "When my parents are angry, they quarrel, and dad dismisses mum from the house. Sometimes they fight up to the point of wounding each other. When mum is angry, she barks at everybody in the house. Their reactions are not good: when they fight and wound each other, they have to be taken to hospital for treatment, and pay the money they'd spend on our school fees and food."

Youth are aware of the significant negative impact domestic violence has on the entire family's health and economic stability. As explained above, the money used to cover medical costs related to the violence could have been spent on school fees for children or other family needs.

Other youth described triggers of violent episodes in the house. Many youth, pointed to alcohol and its role in provoking violent episodes. A fifteen year old male explains,

> "When my dad is angry or sad, he beats children, refuses to eat and goes to drink. When he comes back drunk and finds food on the table, he spills it on the ground, and then goes to sleep....Dad's reaction is not good, because he can wound one of us, and then he'll need money to rush the victim to hospital"

A twelve year old girl explained that violence in her family has become more frequent and effects family relationships.

> "In past, my parents didn't quarrel. It's only these days that they're quarreling, and my father is more and more absent. When dad comes back drunk, he

> disturbs the family and fights with mum. I don't like to see him drunk. In such moments, mum is sad, but after some time she cools down, and things get back to normal. But dad will go away with his friends, and come back late and angry. I hate seeing people barking at each other in the family. It's good neither for parents nor for children."

These exemplars indicate that youth witness and experience diverse types of violence in their home, and that they have linked alcohol use and loss of financial resources to the violence in their home.

Community violence and threats of instability

Instability in the community and communication between people about the threat of violence can impact youth mental health. Youth participants repeatedly described two threats of violence in the community; La Kabanga and sorcerers or witches indicating persistent fear and worry by youth. La Kabanga, an *in vivo* term used by youth that refers to a weapon, specifically a rope used to strangle people; it is also used to refer to people who kill others with this weapon ('Kabanga people'). Many children described deep fear of Kabanga people. This fear is strengthened by discussion about La Kabanga between peers and families in the community. A ten year old female responded, "I'm afraid of the 'Kabanga' people (they strangle people with cords). When I heard a child was killed by them in Walungu, I was afraid. I'm afraid of walking alone at night." An eleven year old male distinguishes between armed combatants from armed conflict and Kabanga people, suggesting that Kabanga people are bandits that kill for no reason rather than being motivated to fight for a particular militia group exclaiming, "I'm also afraid of these bandits who pitilessly kill people at night. I've never met them, but people are strangled by 'Kabanga' men." While these threats of Kabanga men may or may not be fictional, belief in the

concept of stranglers in the night may cause increased fear and isolation of youth. For example, a fourteen year old male described isolating himself from the community to remain safe,

> "When I heard stranglers were killing people in other villages, I was so scared that I couldn't take a walk in my village, because I thought I could bump into them. In order not to be caught by them, I stayed home, and that's what helped me survive. But up to now I'm still afraid of them."

Another threat of violence in youth interviews was violence via "poisoning" from sorcerers, or witches. Traditional beliefs in these settings include belief in sorcerers who may be hidden in the community and who use witchcraft to seek advantage, revenge or to destabilize relationships in families and communities. One 12 year old female recounts, "One day, girls in our village called me a thief and a sorcerer, and said my mother was a sorcerer and a poisoner". Such accusations have the potential to destabilize community relationships and perpetuate revenge related violence. For example, a fourteen year old male recounts, "I've already been angry, especially the day my mother was killed. She had a friend who poisoned her, and then fled to Bukavu. When I consider that I'm motherless, I always say that if anyone shows me my mother's killer, I can also kill her." The existence of belief systems around sorcerers and stranglers can perpetuate fear and feelings of community instability. For example, a 14 year old female remarks, "There's no security in our village because of sorcerers and Kabanga." These beliefs can be further perpetuated in the community and among youth when there is an unexplained death in the family or community that is attributed to sorcery. For example, a fourteen year old girl recounts, "When my friend died, I was afraid, because she was not sick. She was taken to the prayer-room, and then she passed on suddenly. I felt very bad, because I heard my friend was killed by a witch."

Emergent Themes: Cognitive and Behavioral Coping Strategies

Youth described a wide range of coping strategies in response to experiences of trauma and violence and these strategies were grouped into two domains, cognitive and behavioral coping strategies. The most common cognitive strategies included trying to forget the traumatic event and use of prayer, and behavioral strategies such as risk taking behaviors and seeking social support. While trying to forget and praying were grouped as cognitive strategies and risk taking behaviors and social support seeking were grouped as behavioral strategies, there existed considerable overlap between these two domains. For example, engaging in play or spending time with friends was reported as a way to help youth "forget", but it also implies use of social support, particularly if the play is with friends or a distraction activity involves spending time with others. Distraction activities such as playing with friends were grouped under the "trying to forget" theme if the youth stated that the goal of the activity was to help in *trying to forget*. Therefore, there exists potential for coping strategies to be correlated with different domains. Furthermore, while these strategies have been included in existing coping scales their meaning within the Congolese context may be different. In particular, trying to forget and prayer may be particularly helpful coping strategies, especially in the short term, as youth navigate adaptation trajectories over time.

Cognitive Strategies: Trying to Forget

The *most common coping behavior described was "trying to forget*". Although youth engaged multiple coping strategies to deal with stress and trauma, trying to forget was often described as the ultimate goal in dealing with stress and trauma. Many different activities were described as helping children to "forget it all". For example, a 12 year old female responded,

> "To forget it all, I play with my friends. A little time after I've played, sadness goes down. I also share with my friends. We chat about good things that make

> us laugh, and I feel okay. I also pray or sing in order to feel better. When I'm sad, I do my best to get bad thoughts off my mind."

Another 12 year old female describes failed attempts to forget despite trying to distract herself,

> "One day, I was extremely sad, and I went to a wedding ceremony to see if it'd help me forget, but anger went on burning inside me. Sometimes, I keep myself working (fetching water, for instance), but it doesn't help."

Youth described additional ways to forget as coping including prayer, playing with friends, and working. A fifteen year old female suggests that forgetting an event is associated with "moving on." She describes forgetting an event or feeling as turning the page, "When I've taken some sleep or rest, I'm able to turn the page and move on." Other youth described how seeing ability of others to cope positively may help youth to "forget." A fourteen year old boy explains, "When I'm sad or angry, I isolate myself. But when I see that other people are fine, I also forget that I was sad or angry. I manage to forget it." Powerless to change past events, focusing on activities that might lead towards "forgetting" a traumatic event may allow youth to use cognitive distancing to overcome harmful memories.

Cognitive Strategies: Prayer

A second cognitive strategy thematic in the youth interviews was the use of *prayer*. Religion is an important component of Congolese cultural identity. As a support system, religion extends not only to individuals through prayer but also to families and communities by bringing people together in and outside the church. For youth, prayer was described as powerful for reconciling past events and asking forgiveness, giving strength in the present and providing hope

for the future. A fifteen year old girl explains how prayer helps her to cope with past events and forgive and also continues to provide strength in the present,

> "I've been ill at ease, ever since my parents died. I've never seen my dad: it seems he passed on, when I was in my mum's womb. And my mum passed away, when I was 8. My mum told me that dad was killed (poisoned) by someone living in this village. This is no longer a problem to me, because I've already forgiven my dad's killer. When I see this person, I don't feel any grudge in my heart. When I remember my parents, I only pray – it's the only thing I can do. Prayer fortifies me, and keeps these sad thoughts off my mind, although it's difficult sometimes."

Youth described turning to prayer to overcome maladaptive urges such as seeking revenge. A fourteen year old boy explains that in reaction to his mother's death he turns to his faith and prays to get rid of urges to seek revenge,

> "I can get rid of this kind of thoughts only by praying to God. But sometimes these thoughts persist in my heart even after I have prayed. My father told me that I must pray when I begin to have these thoughts, and that prayer will help me forget them."

Prayer is a powerful coping behavior because it draws upon a community resource (religious institutions) and connects that resource through individual action (prayer). In this way, prayer is accessible at all times as a coping strategy but is also rooted in and connected to larger family and community support systems.

Behavioral Strategies: Risk taking behavior

Youth also described a range of *risk taking behaviors* that pose physical and psychological risks to healthy development. Youth reported risk taking behaviors including drinking, stealing, fighting, seeking revenge, violence and other criminal activity. Girls also reported experiencing pressures to marry early or engage in risk taking behaviors including prostitution. A twelve year old girl described, "Raped girls tend to get married too early because of trauma." Another important risk taking behavior reported by both boys and girls was use of alcohol. Drinking alcohol is a coping strategy that most youth are exposed to when they see adults drinking. Drinking was viewed as more common among older children than younger children. One twelve year old girl responded about age differences in coping strategies,

> "They react differently, because younger children and older children think differently: when younger children are angry, they cry and insult others. But older children can go to sleep, to play, to take alcohol, to smoke, to sing, etc."

Whether in the family or in the community, alcohol consumption may be a behavior that youth learn to be a "mature" type of coping behavior without fully understanding risks to their physical and psychological development. Youth participants described risk taking youth as "vagabonds" or a "street kids." This description may imply that youth may be driven towards risk taking behaviors as a coping mechanism when family and social support systems are absent.

Behavioral Strategies: Seeking Support

A key coping behavior thematic in the interviews was actively *seeking support*. *Support seeking was done at multiple levels* – from peers, family and community. The qualitative analysis reveals that the support seeking strategy is multifarious and contingent on the particular circumstances in which a youth is placed in a youth's social ecology. The results of the study affirm previous studies while adding depth and detail to this behavioral strategy in DRC. For some youth peers were a

source of support. Youth use peer relationships to talk about their feelings but also to engage in activities such as play, sports and singing in choirs that can help get their mind off the trauma or stressor they have experienced. For example, a fifteen year old female responded,

> "The advice this friend of mine gives me influences me positively, and helps me deal with problems. It enables me to stop brooding over diverse sad events I have experienced in my life, and I can forget."

The most frequent source of support discussed was immediate family. Youth described the importance of family as a source of counsel or advice when experiencing difficult situations in addition to the family's role in providing basic daily needs such as food and paying school fees. For example, a fifteen year old female responded, "When I have a problem, I talk to my parents. They're the ones who understand me easily and who can help me. When I need something, they give it to me. And they give me advice." Families are an important source of stability and guidance for youth. Youth unable to access family networks for support, particularly financial support, may still seek support as a coping strategy by asking friends and other communities members for help. A fourteen year old female states:

> "When I have problems, my family no longer helps me. Nobody helps me, so I'm on my own. If I'm sick, I'll look for medicine alone. I can ask my friends for money or I can go to a brick-making factory to work for money."

When family support systems are unavailable, youth may rely more heavily on community support systems to supply the resources typically provided by families. Community members can help support caregivers, helping to guide parenting decisions and ways to support youth through difficult situations. By providing support to caregivers, community members can help to address youth's needs and work as a unified team to guide youth towards positive coping behaviors. Youth also recognize the importance of community cohesion. For example, one

fourteen year old female describes community members looking out for one another, "When I hear gunshots or that there are thieves in our neighbors' houses, I am scared... Sometimes when we hear that they're harassing our neighbors, we cry for help. They'll (criminals) then get scared, and take to their heels." Community support systems can take a variety of forms. Communities that are cohesive can offer protection to one another in times of need. Communities can offer support to youth through counsel and mentorship such as types of relationships formed at school and church.

Discussion

Exposure to trauma at the individual, family and community level necessitates that youth employ different cognitive and behavioral coping strategies. Past research has divided coping strategies into two domains, disengagement or emotion focused strategies on the one hand (trying to forget, isolation, substance use) and engagement or problem focused strategies on the other (seeking social support, problem solving, political participation) (Lazarus, 1984). This perspective tends to assert that disengagement/emotion focused strategies are negatively associated with mental health while engagement/problem-focused strategies are positively associated with mental health. The current sought to complicate this normative perspective on coping strategies and to better understand and redefine coping strategies within a specific cultural context. Furthermore, this study highlights the need to understand potential relationships between coping strategies and ways that cognitive and behavioral strategies can be mutually reinforcing in ways that have the potential to help or harm youth well-being.

In eastern Democratic Republic of Congo, different types of cognitive and behavioral coping strategies may be tied to the post-conflict and sociocultural context for youth participants in this study, thus underscoring the importance of context in understanding coping strategies. Where youth may have been limited in their ability to engage with the traumatic event directly (a kind of "problem solving" strategy), youth may turn to alternative strategies such as "trying to

forget" and praying. These cognitive strategies have been described as "disengagement strategies", however it is unclear whether in this context and in other emergency and post-emergency settings these strategies should be considered to negatively affect mental health.

For example, a qualitative study on coping in Sri Lanka after a tsunami disaster observed that many participants found that keeping busy and distracting oneself could be a successful way of dealing with stress (Ekanayake, Prince, Sumathipala, Siribaddana, & Morgan, 2013). The research found that, "many engaged in work and leisure activities and religious rituals as a way of providing relief from their troubles" and found that these activities fulfilled a dual purpose of meeting practical needs (income and livelihood generation) and psychological and emotional distraction (Ekanayake et al., 2013). The participants in this study found that these types of distraction activities were especially important in the immediate aftermath of the disaster and were described as an engagement strategy in early stages of recovery.

Trying to forget may also be representative of a kind of cognitive flexibility, which refers to the ability to "reappraise one's perception and experience of a traumatic situation instead of being rigid in one's perception"(Iacoviello & Charney, 2014). Cognitive flexibility allows acceptance and assimilation of a traumatic experience into one's life and can provide opportunities for growth and recovery. Prayer and faith, a common coping strategy utilized by participants, may be a coping strategy that works as a form of cognitive optimism. Optimism has been conceptualized as the maintenance of positive expectations or hope for the future (Carver, Scheier, & Segerstrom, 2010). Research argues that cognitive flexibility, together with optimism can allow an individual to demonstrate resilience while accepting their current reality (Iacoviello & Charney, 2014).

This study found that family and community support can be protective to youth or can act as a risk factor for negative outcomes. As a protective factor, families provide basic needs, provide safety and security and are a source of material and psychological support. A study in

northern Uganda among 741 former male child soldiers found the role of the family was critical to long term mental health outcomes (Annan et al., 2011). Family dynamics between mother and father are also important. A qualitative study among 86 Palestinian youth affected by conflict, found youth who perceived mothers as loving but not fathers had higher levels of PTSD symptoms as compared to those with parents they both considered loving (Punamäki, Qouta, & El-Sarraj, 2001). As a risk factor, domestic violence can be an ongoing stressor for youth and can result in inability to meet basic needs including food, school fees and health care. The multiple trauma and stressors likely have a cumulative effect and may also impact the types of behavioral and cognitive coping strategies used by youth. As a mediator, coping strategies may be partial (account for only part of the effect from traumatic event(s) to outcome) or total (account for all of the effect from traumatic event(s) to outcome). Considering trauma exposure on the individual, family and community level adds complexity to the ways we consider trajectories of resilience.

Given the collectivist nature of Congolese identity, community relationships have a role in shaping coping strategies. In this study participants sought support among peers, siblings, family, teachers, churches and other community members. Research has found that social support and feeling connected to neighborhoods and schools is associated with better mental health outcomes in children (Kliewer, Lepore, Oskin, & Johnson, 1998) Prayer and religious faith was a common coping strategy utilized participants and connect individuals with religious support systems. This can be a key coping resource for individuals, particularly where they feel able to ask questions and gain counsel about their traumatic experiences. Research indicates that religious coping has a moderate positive association with psychological adjustment (Ano & Vasconcelles, 2005).

While community support systems are important resources for youth, these systems can also contribute to processes of fear, in the case of DRC through interpretation of illness as being

caused by sorcerers or witches. Intervention approaches aimed at improving coping strategies in youth should collaborate with local leaders to develop approaches that are non-judgmental towards traditional belief systems related to causes of illness and work in collaboration with leaders to develop interventions that minimize negative effects of these beliefs such as perpetuating fear leading to social isolation. Social support seeking also has the potential to lead to risk taking behaviors. For example, it is plausible that some peer-support seeking could potentially increase the likelihood of engaging in risk-taking behaviors such as drinking, a negative coping behavior usually employed in social settings. Supporting positive group activities for youth could extract the benefits received through socializing in peer networks and could potentially deter youth from utilizing risk-taking behavior in social groups.

Understanding the complexity of coping among conflict-affected youth in the context of the DRC helps develop a more complete theory of cognitive and behavioral coping strategies that is helpful for modeling pathways for empirical testing. For example, unlike previous research, this study reveals that disengagement strategies can be an effective coping strategy within this context. Reliance on the western constructs of coping may inappropriately prioritize certain coping strategies as beneficial, such as engagement or problem-solving strategies, when these types of strategies may be of secondary concern or simply lacking meaning in contexts where youth are impacted by conflict related traumatic stressors. In addition to recognizing use of a particular strategy, this study identifies the possibility of overlap between coping domains and mutually reinforcing relationships between particular strategies that could potentially help or harm youth well-being. Future research could benefit from a more complex understanding of the relationships between coping strategies and potential reinforcing relationships between cognitive and behavioral strategies. A context specific framework can provide a springboard for implementing effective interventions.

2. Assessing coping strategies of youth in the DRC: Associations with mental health and well-being

Sample Demographics

The final sample of 434 youths included 224 boys (51.6%) and 210 girls (48.4%) and the mean age was 12.8 (SD=1.8) (Table 3). A total of 386 (89.2%) youth were currently enrolled in school with 289 (66.5%) enrolled in primary school and 83 (19.1%) youth enrolled in secondary school.

Table 3. Demographic Characteristics Among Youth at 6-months

	N=434	**%**
Gender		
Female	210	51.6
Male	224	48.4
Age		
10	60	13.9
11	56	12.9
12	78	18.0
13	58	13.4
14	65	15.0
15	116	26.8
Mean age (SD)	12.8 (1.77)	
Enrollment in School		
Enrolled in School	386	89.2
Not Enrolled in School	47	10.9
Class Level		
Primary	289	66.5
Secondary	83	19.1
Missing	14	3.2
Village		
Karhagala	59	13.6
Kamisimbi	33	7.6
Lurhala	45	10.4
Kahembari	65	15.0
Cagombe	42	9.7
Cahi	45	10.4
Irhaga	41	9.5
Karherwa	29	6.7
Izege	44	10.1
Cize	31	7.1
Mental Health and Well-Being Outcomes	**Mean Score (SD)**	**Range**
Internalizing Problems	1.25 (0.26)	1-3
Externalizing Problems	1.19 (0.21)	1-2.1
Prosocial Attitudes/Behaviors	2.93 (0.61)	1.13-4
Self-Esteem	7.58 (1.22)	1-10

Exposure to Trauma

The mean number of types of potentially traumatic events ever experienced were 2.31 among girls and 2.22 among boys (Table 4). Trauma exposure type by sex and age group are presented in Figure 5. Older youth, ages 13-15 experienced significantly more traumatic events as compared to youth ages 10-12 (2.62 vs. 1.83, $p<0.001$). Breaking down traumatic experiences by type revealed that for all categories except material deprivation, as expected, older youth experienced more trauma. Material deprivation (i.e. lack of food or water, lack of shelter or ill health without access to medical care) was the most common traumatic event experienced with 62% of the population having experienced material deprivation. In total, 27% of the sample experienced coercion (imprisonment, brainwashing, forced isolation, forced separation from family, being kidnapped or being close to death); girls experienced more coercion than boys 31.4% versus 22.8% respectively, and this difference was statistically significant ($p=0.043$). In total, 42.4% of the sample experienced or witnessed violence to others (unnatural death of family or friend, murder of family or friend, murder of stranger, witness to rape or sexual violence) with 48.1% of ages 13-15 and 35.6% of ages 10-12 experiencing violence to others ($p<0.0001$). In total, 19.8% of the sample experienced bodily injury (torture, serious injury, rape or sexual assault or other types of sexual humiliation) with 24.3% of youth ages 13-15 experiencing bodily injury and 14.4% of ages 10-12 experiencing bodily injury ($p=0.009$). The lowest type of traumatic exposure was experiences of combat with 8.3% of the total sample, 11.3% of ages 13-15 and 4.1% of ages 10-12 having experienced combat ($p=0.009$).

Figure 5. Trauma Exposure by Sex and Age Group

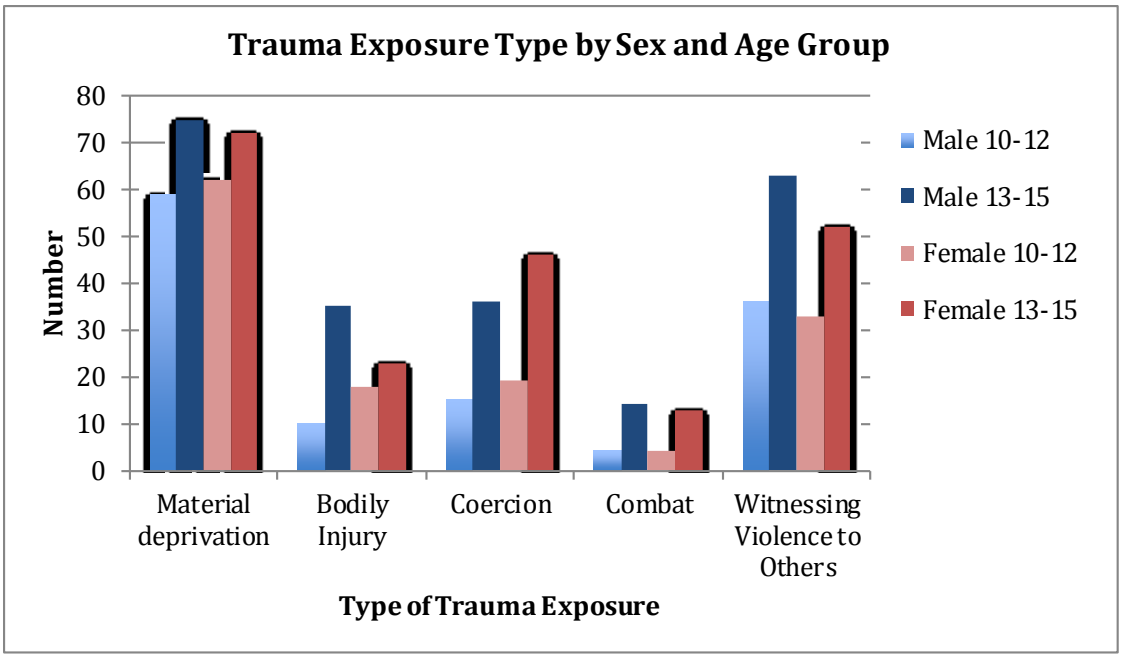

Trauma Exposure Type by Sex and Age Group
Number
80
70
60
50
40
30
20
10
0
Material deprivation
Bodily Injury
Coercion
Combat
Witnessing Violence to Others
Type of Trauma Exposure
Male 10-12
Male 13-15
Female 10-12
Female 13-15

Table 4. Trauma Exposure by Gender and Age

	Male	Female			Ages 10-12	Ages 13-15			Total
	Mean (SD)	**Mean(SD)**	**B**	**p**	**Mean (SD)**	**Mean(SD)**	**B**	**p**	**Mean (SD)**
Trauma Exposure	2.22	2.31 (SD)	0.43	0.669	1.83	2.62	3.93	**0.000****	2.26 (2.1)
	N (%)	**N (%)**	**OR**	**p**	**N (%)**	**N (%)**	**OR**	**P**	**N (%)**
Material Deprivation	134 (59.8)	135 (64.3)	1.20	0.339	121 (62.4)	147 (61.5)	0.96	**0.854**	269 (62.0)
Bodily Injury	45 (20.1)	41 (19.5)	0.97	0.883	28 (14.4)	58 (24.3)	1.90	**0.012***	86 (19.8)
Coercion	51 (22.8)	66 (31.4)	1.55	**0.043***	34 (17.5)	82 (34.3)	2.46	**0.000****	117 (27.0)
Combat	18 (8.0)	18 (8.6)	1.07	0.840	8 (4.1)	27 (11.3)	2.96	**0.009****	36 (8.3)
Violence to Others	99 (44.2)	85 (40.5)	0.86	0.433	69 (35.6)	115 (48.1)	1.68	**0.009****	184 (42.4)

Table 5. Oblique Promax Rotated Factor Loadings

Adapted KidCope Item	**Coping Category (Spirito et.al 1998)**	**Problem Focused**	**Emotion Focused**	**Avoidance**	**Faith**
Do something else Try to Forget it	Distraction	-0.27	0.03	**0.76**	-0.07
Try to fix the problem by thinking of answers Try to fix the problem by doing something	Problem Solving	**0.82**	0.05	-0.20	-0.05
Try to calm yourself down Sing a song to calm down*	Emotional Regulation	0.20	**0.71**	0.07	0.06
Try to feel better by spending time with family and friends	Seeking Social Support	0.20	**0.39**	0.04	-0.08
Do nothing because problem could not be fixed Just go to sleep*	Resignation	-0.29	**0.46**	-0.27	-0.29
Prayer to feel better*	Prayer*	-0.30	0.01	-0.28	**0.50**

*Additional Items based on qualitative research

KidCope Factor Analysis

Confirmatory factor analyses were used to assess the adequacy of factor structures suggested by previous studies using the KidCope. The only study to date that has used the KidCope in conflict settings was a study conducted by Mels et al (2013) in the DRC which found a 2 factor engagement/disengagement factor structure had reasonable reliabilities and acceptable fit for subscales (Mels et al., 2013). In this study, the fit for the engagement and disengagement two-factor model indicated poor fit CFI =0.683, TLI =0.594, and RMSEA=0.040. Because the two-factor model did not yield good fit to the current data, exploratory factor analysis was used to establish a suitable factor structure for these data. Wishful thinking and blaming self/others were dropped at the item level due to low response rate in our population (<5%). Social withdrawal and cognitive restructuring were removed due to high cross loadings and collinearity with social support and prayer respectively. The four factors retained accounted for 81.7% of the variability in the data. The four retained factors were defined as *problem focused* coping including behavioral and cognitive attempts directed toward fixing the cause of a problem, *emotion focused* coping focused on changing one's own emotions to feel better through self-regulation, social support seeking and rest, *avoidan*t coping strategies including attempts to "just forget it" or distract oneself by playing a game or engaging in another activity, and *faith based* coping including use of prayer in response to a stressor (Table 4). Avoidance and problem focused strategies were significantly correlated (Corr=0.15; p=0.0020), and avoidance and faith based strategies were significantly correlated (Corr=-0.12; p=0.0119).

Analysis of coping strategy by age and sex indicated avoidant and emotion focused strategies were the most commonly utilized strategies in our sample (Table 5). In addition, older youth, ages 13-15, used more emotion focused strategies than younger youth ages 10-12. There was no significant difference in use of any coping strategies by sex in the bivariate regression analysis, however there was a marginal significant difference in problem-focused coping strategies with boys using more of this type of strategy than girls (p=0.076).

Simple linear regression of total trauma and trauma type on coping strategy use revealed statistically significant associations (Table 7.). Total trauma experiences was negatively associated with problem focused strategies (B=-0.02; p=0.043) and positively associated with emotion focused strategies (B=0.01; p=0.016) suggesting that as cumulative trauma exposure increases, youth tend to use problem focused strategies less and emotion focused strategies more. Experience of bodily injury reduced use of problem focused strategies (p=0.029). Experiencing coercion increased use of emotion-focused strategies (B=0.06; p=0.021). Witnessing violence to others increased use of emotion-focused strategies (B=0.05; p=0.025) and reduced use of avoidance (B=-0.09; p=0.016). Exposure to trauma, by total experiences or type, did not have any significant association with use of the faith-based coping strategy.

Table 6. Coping Across Age and Sex

	Mean (SD)				Mean (SD)				Mean (SD)
	Male N=224	Female N=210			Ages 10-12 N=194	Ages 13-15 N=239			Total N=434
Coping Strategy	Mean (SD)	Mean (SD)	t	p	Mean (SD)	Mean (SD)	t	p	Mean (SD)
Problem Focused	0.15 (0.35)	0.09 (0.28)	-1.78	0.076	0.10 (0.29)	0.13 (0.33)	1.10	0.270	0.12 (0.32)
Emotion Focused	0.14 (0.21)	0.16 (0.25)	0.83	0.406	0.12 (0.20)	0.18 (0.24)	2.77	**0.006***	0.15 (0.23)
Avoidance	0.18 (0.39)	0.23 (0.40)	1.19	0.237	0.19 (0.38)	0.22 (0.41)	0.88	0.380	0.20 (0.39)
Faith	0.09 (0.30)	0.10 (0.30)	1.32	0.188	0.10 (0.29)	0.09 (0.31)	-0.52	0.606	0.10 (0.30)
Total	0.55 (0.62)	0.58 (0.65)	0.45	0.656	0.51 (0.60)	0.62 (0.65)	1.85	0.065	0.56 (0.63)

Table 7. Trauma Regressions on Coping Strategy

	Problem Focused		Emotion Focused		Avoidance		Faith	
	B (SE)	P	B (SE)	P	B (SE)	P	B (SE)	P
Total Trauma	-0.02 (0.01)	**0.043***	0.01 (0.01)	**0.016***	-0.01 (0.01)	0.139	-0.00 (0.01)	0.605
Material Deprivation	-0.03 (0.03)	0.282	0.03 (0.02)	0.125	-0.01(0.04)	0.773	0.03 (0.03)	0.330
Bodily Injury	-0.09 (0.04)	**0.029***	0.01 (0.03)	0.655	-0.08 (0.05)	0.089	0.01 (0.04)	0.768
Combat	-0.09 (0.06)	0.113	0.05 (0.04)	0.255	-0.08 (0.07)	0.251	-0.06 (0.05)	0.221
Coercion	-0.04 (0.03)	0.253	0.06 (0.02)	**0.021***	-0.06 (0.04)	0.179	-0.01 (0.03)	0.729
Violence to Others	-0.05 (0.03)	0.104	0.05 (0.02)	**0.025***	-0.09 (0.04)	**0.016***	-0.02 (0.03)	0.476

The results of regression analysis on internalizing problems are presented separately for males and females in Table 8. Model 3 best explained variance in internalizing problems for girls (15.4%) and Model 2 best explained variance in internalizing problems in boys (25.1%). In older boys there were fewer internalizing problems reported (β=-0.15, p=0.016). Total trauma exposure (β=0.26, p<0.0001) and being a victim of an attack (β=-0.18, p=0.001) was associated with increased internalizing problems in boys and belief their home was not safe was associated with increased internalizing problems in both boys (β=0.23, p<0.0001) and girls (β=0.19, p<0.005).

Problem focused coping was significantly associated with increased internalizing problems in both boys (β =0.31; p<0.0001) and girls (β =0.35, p<0.0001). When the interaction term of problem focused coping with emotion focused coping was included in model 3 in the hierarchical regression analysis for girls, it was found that the interaction effect significantly reduced internalizing problems in girls (β =-0.31; p<0.0001). Use of emotion focused coping strategies was associated with reduced internalizing problems in boys (β =-0.10; p=<0.041). Use of the avoidance coping strategy was marginally significant in reducing internalizing symptoms in girls (β =-0.12; p=<0.055).

Multivariable Hierarchical Regressions

Table 8. Multivariable Hierarchical Regressions of Internalizing Problems on Independent Variables

		Boys[ŧ]				Girls[ç]			
Model		b	SE	β	p	b	SE	β	p
M1	Age	-0.015	0.007	-0.139	**0.030***	0.009	0.008	0.083	0.232
	Total Trauma	0.020	0.006	0.223	**0.002****	0.011	0.006	0.118	0.060
	Attack Victim	0.126	0.038	0.176	**0.001****	0.094	0.062	0.113	0.131
	Home Violence	0.128	0.039	0.225	**0.001****	0.090	0.032	0.190	**0.005****
	Village Violence	-0.067	0.028	-0.139	**0.017***	0.012	0.035	0.024	0.735
	Constant	1.347	0.089		0.000	1.043	0.094		0.000
M2	Age	-0.015	0.006	-0.146	**0.016***	0.009	0.008	0.081	0.242
	Total Trauma	0.024	0.006	0.263	**0.000*****	0.012	0.006	0.127	**0.040***
	Attack Victim	0.130	0.040	0.180	**0.001***	0.086	0.059	0.105	0.145
	Home Violence	0.133	0.036	0.233	**0.000*****	0.095	0.032	0.200	**0.003****
	Village Violence	-0.056	0.028	-0.116	**0.049***	0.013	0.035	0.026	0.715
	Problem Focused	0.169	0.038	0.310	**0.000*****	0.111	0.053	0.163	**0.040***
	Emotion Focused	-0.092	0.045	-0.101	**0.041***	-0.027	0.049	-0.034	0.586
	Avoidance	0.001	0.028	0.001	0.981	-0.053	0.030	-0.113	0.076
	Faith	-0.035	0.036	-0.057	0.330	0.007	0.041	0.011	0.867
	Constant	1.338	0.085		0.000	1.049	0.094		0.000
M3	Age	-0.015	0.006	-0.142	**0.020***	0.011	0.007	0.101	0.133
	Total Trauma	0.024	0.006	0.258	**0.000*****	0.012	0.006	0.122	0.052
	Attack Victim	0.133	0.040	0.185	**0.001****	0.080	0.058	0.097	0.167
	Home Violence	0.132	0.035	0.231	**0.000*****	0.091	0.032	0.191	**0.005****
	Village Violence	-0.055	0.028	-0.115	0.050	0.022	0.033	0.046	0.507
	Problem Focused	0.200	0.050	0.368	**0.000*****	0.239	0.062	0.353	**0.000*****
	Emotion Focused	-0.074	0.045	-0.082	0.100	0.038	0.050	0.050	0.443
	Avoidance	0.003	0.028	0.007	0.911	-0.055	0.029	-0.119	**0.055**
	Faith	-0.027	0.036	-0.044	0.457	0.026	0.042	0.041	0.538
	ProblemxEmotion	-0.214	0.146	-0.094	0.144	-0.463	0.118	-0.306	**0.000*****
	Constant	1.328	0.085		0.000	1.008	0.089		0.000

Note. SE=Robust standard errors; p*<0.05, **p<0.01, ***p<0.001

ŧ R^2=0.1355 for step 1, p=0.0000; R^2=0.2458 for step 2, p=0.0001; R^2=0.2507 for step 3, p=0.1437

ç R^2=0.0747 for step 1, p=0.0064; R^2=0.1076 for step 2, p=0.034; R^2=0.1537 for step 3, p=0.0001

The results of hierarchical regressions on externalizing problems indicated model 3 was the best fit for explaining the variance in externalizing symptoms in boys (8.5%) and girls (10.4%) (Table 9). Problem focused coping increased externalizing problems in both boys (β =0.34; p=<0.0001) and girls (β =0.37; p=<0.001). The interaction effect of problem focused coping with emotion focused coping was associated with decreased externalizing problems in boys (β =-0.17; p=<0.047) and girls (β =-0.24; p=<0.009).

Table 9. Multivariable Hierarchical Regressions of Externalizing Problems on Independent Variables

		Boys[ŧ]				Girls[ç]			
Model		b	SE	β	p	b	SE	β	p
M1	Age	-0.003	0.005	-0.033	0.608	0.002	0.005	0.031	0.647
	Total Trauma	-0.003	0.004	-0.055	0.336	0.003	0.005	0.043	0.533
	Attack Victim	0.015	0.041	0.026	0.717	0.068	0.043	0.121	0.113
	Home Violence	0.023	0.035	0.052	0.514	0.006	0.021	0.018	0.760
	Village Violence	-0.032	0.026	-0.088	0.226	-0.008	0.022	-0.022	0.728
	Constant	1.188	0.065		0.000	1.101	0.067		0.000
M2	Age	-0.004	0.005	-0.051	0.393	0.002	0.005	0.023	0.731
	Total Trauma	-0.002	0.004	-0.032	0.595	0.003	0.005	0.042	0.549
	Attack Victim	0.013	0.042	0.023	0.757	0.067	0.039	0.119	0.083
	Home Violence	0.023	0.032	0.053	0.482	0.012	0.020	0.035	0.547
	Village Violence	-0.023	0.027	-0.064	0.390	-0.008	0.022	-0.023	0.720
	Problem Focused	0.094	0.027	0.231	**0.001****	0.113	0.046	0.219	**0.016***
	Emotion Focused	0.040	0.044	0.059	0.368	0.016	0.041	0.028	0.701
	Avoidance	-0.014	0.022	-0.040	0.511	-0.046	0.024	-0.131	0.058
	Faith	-0.003	0.029	-0.007	0.915	-0.021	0.028	-0.045	0.457
	Constant	1.186	0.061		0.000	1.109	0.066		0.000
M3	Age	-0.003	0.005	-0.043	0.468	0.003	0.005	0.032	0.629
	Total Trauma	-0.003	0.004	-0.042	0.486	0.003	0.005	0.038	0.596
	Attack Victim	0.018	0.042	0.031	0.672	0.063	0.038	0.112	0.099
	Home Violence	0.022	0.032	0.051	0.485	0.009	0.020	0.027	0.633
	Village Violence	-0.023	0.026	-0.065	0.375	-0.003	0.021	-0.007	0.903
	Problem Focused	0.137	0.034	0.339	**0.000****	0.190	0.056	0.369	**0.001****
	Emotion Focused	0.063	0.045	0.093	0.168	0.047	0.042	0.082	0.262
	Avoidance	-0.011	0.022	-0.031	0.616	-0.045	0.023	-0.129	0.055
	Faith	0.007	0.029	0.016	0.795	-0.012	0.028	-0.025	0.679
	ProblemxEmotion	-0.298	0.149	-0.174	**0.047***	-0.303	0.115	-0.241	**0.009****
	Constant	1.172	0.061		0.000	1.093	0.063		0.000

Note. SE=Robust standard errors

ŧ R^2=0.0143 for step 1, p=0.6141; R^2=0.0678 for step 2, p=0.0138; R^2=0.0846 for step 3, p=0.0471

ç R^2=0.0188 for step 1, p=0.5419; R^2=0.0734 for step 2, p=0.0967; R^2=0.1043 for step 3, p=0.0093

p*<0.05, **p<0.01, ***p<0.001

Regressions on prosocial behavior revealed Model 2 fit best for both boys and girls and no interaction terms between coping strategies were significant (Table 10). Model 2 explained 12.1% of the total variance in prosocial behavior for boys and 12.7% of the total variance in prosocial behavior for girls. Problem focused coping reduced prosocial behavior scores in both boys (β =-0.32; p=<0.0001) and girls (β =-0.24; p=<0.0001). For girls, feeling that they were not safe from violence at home decreased pro-social behavior (β =-0.18; p=0.008).

Table 10. Multivariable Hierarchical Regressions of Prosocial Behavior on Independent Variables

		Boys[ŧ]				Girls[ç]			
Model		b	SE	β	p	b	SE	β	p
M1	Age	0.023	0.021	0.072	0.271	0.033	0.024	0.097	0.175
	Total Trauma	-0.010	0.016	-0.038	0.523	0.019	0.021	0.064	0.372
	Attack Victim	0.161	0.135	0.073	0.234	0.054	0.172	0.023	0.753
	Home Violence	-0.016	0.104	-0.010	0.874	-0.228	0.100	-0.157	**0.023***
	Village Violence	0.001	0.113	0.001	0.990	0.102	0.101	0.071	0.311
	Constant	2.640	0.274		0.000	2.460	0.295		0.000
M2	Age	0.028	0.021	0.089	0.169	0.038	0.023	0.111	0.106
	Total Trauma	-0.020	0.015	-0.077	0.194	0.017	0.021	0.056	0.429
	Attack Victim	0.160	0.135	0.073	0.237	0.029	0.155	0.012	0.850
	Home Violence	-0.024	0.106	-0.014	0.822	-0.264	0.099	-0.181	**0.008****
	Village Violence	-0.043	0.114	-0.029	0.709	0.097	0.095	0.067	0.310
	Problem Focused	-0.523	0.090	-0.322	**0.000*****	-0.509	0.121	-0.243	**0.000*****
	Emotion Focused	-0.016	0.161	-0.006	0.922	-0.112	0.162	-0.046	0.490
	Avoidance	0.007	0.084	0.005	0.936	0.012	0.091	0.008	0.897
	Faith	0.131	0.108	0.070	0.226	0.210	0.119	0.107	**0.080**
	Constant	2.669	0.266		0.000	2.453	0.283		0.000

Note. SE=Robust standard errors

ŧ R^2=0.017 for step 1, p=0.6366; R^2=0.1205 for step 2, p=0.0000

ç R^2=0.0481 for step 1, p=0.0402; R^2=0.1273 for step 2, p=0.0002

p*<0.05, **p<0.01, ***p<0.001

Model 2 fit best for both boys and girls and explained 17.1% of the variance in esteem for boys and 14.3% of the variance in self-esteem for girls (Table 11). For boys, emotion focused coping and faith based coping increased self-esteem (emotion: β=0.16; p=0.002; faith: β=0.15; p=0.018). Having been the victim of an attack and belief that their village was not safe from violence decreased self-esteem in boys (β =-0.24; p=0.001) and (β =-0.18; p<0.008) respectively; and problem focused coping decreased self-esteem for boys (β =-0.12; p=0.026). For girls, avoidance increased self-esteem (β =0.18; p=0.005) and faith based reached marginal significance at increasing self-esteem (β=0.14; p=0.051). Girls who felt their village was not safe had lower self-esteem (β =0.28; p=<0.0001).

Table 11. Multivariable Hierarchical Regressions of Self-Esteem on Independent Variable

		Boys[ŧ]				Girls[ç]			
Model		b	SE	β	p	b	SE	β	p
M1	Age	0.027	0.033	0.067	0.410	-0.032	0.035	-0.059	0.354
	Total Trauma	0.030	0.029	-0.239	0.311	-0.010	0.035	-0.021	0.779
	Attack Victim	-0.907	0.273	0.023	**0.001****	0.019	0.253	0.005	0.940
	Home Violence	0.068	0.186	-0.199	0.714	0.045	0.153	0.019	0.769
	Village Violence	-0.510	0.179	0.067	**0.005****	-0.696	0.167	-0.293	**0.000*****
	Constant	7.502	0.433		0.000	8.188	0.433		0.000
M2	Age	0.013	0.033	0.024	0.690	-0.044	0.035	-0.080	0.218
	Total Trauma	0.020	0.028	0.046	0.464	0.003	0.037	0.007	0.927
	Attack Victim	-0.912	0.259	-0.241	**0.001****	0.106	0.258	0.027	0.680
	Home Violence	0.031	0.189	0.010	0.871	0.044	0.150	0.018	0.770
	Village Violence	-0.467	0.175	-0.182	**0.008****	-0.654	0.162	-0.275	**0.000*****
	Problem Focused	-0.338	0.151	-0.123	**0.026***	0.218	0.211	0.062	0.304
	Emotion Focused	0.752	0.240	0.163	**0.002****	0.184	0.290	0.046	0.527
	Avoidance	0.181	0.147	0.073	0.220	0.419	0.146	0.176	**0.005****
	Faith	0.496	0.207	0.154	**0.018***	0.446	0.227	0.138	**0.051**
	Constant	7.568	0.423		0.000	8.091	0.438		0.000

Note. SE=Robust standard errors
ŧ R^2=0.1076 for step 1, p=0.0008; R^2=0.1709 for step 2, p=0.0001
ç R^2=0.0900 for step 1, p=0.0024; R^2=0.1432 for step 2, p=0.0130
p*<0.05, **p<0.01, ***p<0.001

Discussion

Coping Strategies

The purpose of this study was to explore youth coping strategies and to examine associations between coping strategies and mental health and well-being outcomes in eastern DRC. Research has called for more detailed exploration of coping strategies beyond the original engagement disengagement two factor structure originally proposed for the KidCope (Solveig Holen, Lervåg, Waaktaar, & Ystgaard, 2012), and building on original conceptualizations of the effectiveness of problem focused vs. emotion focused coping strategies. The critique on this original coping strategy dichotomy is driven by the hypothesis that among trauma-affected youth, certain adaptive coping strategies such as distraction and avoidance, which were originally conceptualized as maladaptive, may actually be positive adaptations in some cultures and in the context of humanitarian settings.

Factor analysis in our data revealed four distinct types of coping strategies: problem focused, emotion focused, avoidant and faith-based strategies. In our sample, emotion focused and avoidance

coping strategies were the most frequently reported strategies used by both male and female children. Children exposed to higher levels of trauma were less likely to use problem focused coping less and more likely to use emotion focused coping. This finding is supported by previous research which indicates that problem focused coping may be more prevalent in situations where youth have more control over their stressors and decrease in less frequent in uncontrollable situations (Aldwin, 2007; Pincus & Friedman, 2004).

Problem Focused Coping

Problem focused coping, which is usually perceived as beneficial actually worsened internalizing and externalizing symptoms and reduced prosocial behaviors in our sample. This is likely due to the inability of youth to directly "solve" the source of their trauma whether it was victimization or witnessing violence or material deprivation. Previous research in conflict settings supports this finding. For example, among Israeli children exposed to scud missile attacks it was found that, "persisting in problem-focused coping in a situation that cannot be changed can lead to undesirable consequences"(Weisenberg, Schwarzwald, Waysman, Solomon, & Klingman, 1993). Research among Palestinian youth found that active coping was not effective in protecting children's mental health (Punamaki & Suleiman, 1990). Similarly, Elklit et al (2012) found that problem focused and avoidant coping strategies were related to higher levels of PTSD among trauma-affected youth in Bosnia and noted that the inability to impact life decisions may explain this finding (Elklit, Ostergard Kjaer, Lasgaard, & Palic, 2012). Another study among Bosnian adolescents found that engagement coping strategies increased PTSD symptoms, whereas disengagement coping strategies were associated with fewer PTSD symptoms (Jones, 2002). In the context of conflict and other humanitarian contexts, problem-focused coping as a strategy used alone may worsen internalizing and externalizing problems and reduce self-esteem and prosocial behavior. Research suggests that without effective emotional regulation, trauma affected children may exhibit increased aggressive behavior, a form of externalizing behavior (Pat-Horenczyk et al., 2014) It is also plausible that some

of the problem-focused strategies youth employ, such as stealing to reduce economic stress or consuming alcohol to reduce emotional stress, may be harmful. Problem focused coping strategies may add additional stress if the stressors the youth are trying to "fix" cannot be changed. Furthermore, trying to fix problems as an individual, rather than seeking support from peers, family and community may explain why problem-focused coping could be harmful in situations and contexts where social support is critical to improving mental health. Interestingly, problem-focused coping was associated with lower prosocial behavior scores in both girls and boys. This finding suggests that problem-focused coping may limit opportunities to engage with peers and community members.

Avoidant Coping

Avoidant coping strategies that seek to "just forget it" or distract oneself may in the short-term be effective in reducing psychological distress in contexts of ongoing conflict with profound limitations of an individual to engage with or "fix" their stressor. For example a study with Sudanese refugees found that distancing or avoidance coping in the context of chronic stress might promote positive adaptation in the short term (Boxer, Sloan-Power, Mercado, & Schappell, 2012). Use of avoidant coping may foster recovery from traumatic stress by allowing youth to distance themselves and engage in activities that help recoup lost resources (Shimazu & Kosugi, 2003). Two studies with refugee youth from Vietnam and Sudan found that youth prefer not to talk about experiences of traumatic events and therefore distraction was a more commonly employed coping strategy (Goodman, 2004; R. K. Kohli & Connolly, 2009).

In this study, avoidant coping was marginally significant in reduced internalizing and externalizing problems in girls. No change in outcome measures was observed in boys using avoidant coping. Similar to the results found with problem focused coping, use of avoidant coping may affect different outcomes along different paths. Some research suggests that avoidant coping strategies may be more adaptive in the short term but less adaptive in the long term and consideration of

adaptive trajectories in coping warrants further research (Fonagy & Target, 2003; Kerig, Becker, & Egan, 2010; Van der Kolk, 1996). While support for avoidance as a positive coping strategy for girls is limited, these results suggest avoidance may not be a negative strategy within this context.

Emotion Focused Coping

Emotion focused strategies seek to manage emotional distress and can include disengaging from emotions, distraction, and seeking emotional support (Folkman & Moskowitz, 2004). Emotion focused coping, a strategy preferred by youth in this study and in other studies in conflict-affected contexts, may be a positive adaptive response to stress. In this study, youth ages 13-15 used more emotion-focused coping than ages 10-12 which is consistent with previous research that indicates as children develop, cortical function increases and coping repertoire shifts from behavioral to cognitive strategies (E. A. Skinner & Zimmer-Gembeck, 2007). Among boys, emotion focused coping increased self-esteem. It is plausible that boys who are able to process their emotions effectively feel a greater sense of self-worth and therefore have higher self-esteem. Greater use of emotion focused coping, particularly use of social support seeking to regulate emotions, may provide enhanced social relationships and greater closeness with peers, family and the community. A previous study in the DRC found that use of disengagement coping lowered psychological symptoms (Mels et al., 2013).

Hobfall's Conservation of Resources theoretical model (COR) theorizes that individuals 'strive to retain, protect and build resources and that what is threatening to them is the potential or actual loss of valued resources' (Hobfoll, 1989). After people experience potentially traumatic events, they are at risk for a loss of material, social and psychological resources and with each resource loss, additional loss can occur creating a spiral of loss that can negatively impact mental health (Hobfoll, 1989). Some research suggests that emotion focused coping may reduce stress and provide safety or "conservation of resources," particularly in humanitarian contexts with ongoing conflict. In this way, emotion focused coping allows youth to have control over emotional resources which can be particularly important when youth are facing resource loss at the individual, family and

community level as a result of conflict. Emotion focused coping may also be particularly effective when used in conjunction with other coping strategies (discussed below).

Faith Based Coping

Research indicates that when faced with stress, people rely on religion as a coping strategy and this strategy has been assessed as protective in cross-sectional studies, albeit with mixed evidence (Tol et al., 2013). Faith coping was associated with lower anti-social behavior and depressive symptoms among adolescent girls in the occupied Palestinian territory (Brian K Barber, 2001). Religiosity was associated with lower PTSD symptoms in Bosnian and Croatian adolescents (Durakovic-Belko, Kulenovic, & Dapic, 2003) and lower psychological symptoms in former Ugandan child soldiers (Klasen et al., 2010). In this study, faith based coping was significantly associated with increased self-esteem in both boys and girls. Research suggests that positive religious coping may be linked to believing there is meaning in life, seeking support from religious community and religious forgiving, whereas negative religious coping may include reappraisal of God's powers and spiritual discontent (Pargament, Koenig, & Perez, 2000). Use of faith based coping may also overlap with other important factors such as availability of social support systems and the degree to which youth access community resources via institutions such as the church and religious events. Research with Sudanese refugees found that participants used their belief in God as a form of emotional support (Schweitzer et al., 2007). Furthermore the study found that the refugee's faith promoted social interaction through church and these interactions provided social, informational and material support (Schweitzer et al., 2007). More research is needed to better understand faith based coping strategies as there are conflicting results indicating that religious coping both positively and negatively affects mental health. Some research suggests that religious coping is linked with fewer symptoms of psychological distress, however another study among conflict-affected youth found that religious coping worsened depression and anxiety symptoms among adolescents from the Gaza Strip (Khamis, 2015; Pargament, Desai, McConnell, Calhoun, & Tedeschi, 2006).

Coping Flexibility and Interaction Effects

Interestingly, research has suggested that coping flexibility, use of multiple strategies or effectively modifying a coping strategy according to the stressors present in a situation is key to understanding the impacts on psychological distress and may be more beneficial than any one strategy alone (Cheng, Lau, & Chan, 2014; Kato, 2015). Children who can adapt their coping strategies to specific stressors and are flexible in their use of coping strategies have better outcomes than children who rely solely on one type of strategy (Weisz et al., 1994). However, very little research has focused on how coping strategies interact with one another to impact outcomes (Khamis, 2015). Effectiveness of coping flexibility may also be dependent on culture. A meta analysis by Cheng and Chan (2014) from 11 cultural regions, found that coping flexibility was more effective in cultures that were less individualistic and more collective in how they viewed their situation (Cheng et al., 2014). The authors argue that in more individualistic societies, importance placed on autonomy leads to valuing of self-consistency rather than flexibility in responses to situational demands. In contrast, countries with lower levels of individualism place greater importance on relationship between individuals and their environments and emphasize interrelated nature of existence and the persistence state of flux and change that supports situational behavior and flexibility (Cheng et al., 2014).

In this study, problem focused strategies combined with emotion focused strategies reduced internalizing problems in girls and externalizing problems in boys and girls. This finding suggests that coping strategy flexibility may provide an opportunity for problem focused strategies to be effective. This finding is consistent with previous research in the DRC which found that the interaction effect between disengagement and engagement coping strategies was related to lower psychological symptoms (Mels et al., 2013). It is also possible that problem focused and emotion focused coping strategies are not mutually exclusive and can overlap in their functional achievement of stress reduction and well-being. For example, trying to fix a problem can also serve to calm a person down

(Ellen A Skinner et al., 2003). Furthermore emotion focused coping may be used with problem-focused coping in a cyclical and synergistic dynamic whereby emotional strength gained from emotion focused coping provides energy for subsequent problem-focused strategies (Shimazu & Kosugi, 2003; Ellen A Skinner et al., 2003). Without use of emotion focused coping, youth may lack the social support require to make problem focused strategies a successful adaptation to stress (Dodge, Bates, & Pettit, 1990).

3. Trauma Affected Youth Coping Strategies and External Factors at the Peer, Family and Community Level: A Structural Equation Model of Youth Coping and Resilience

Sample Description

The sample included 399 youth, 206 (51.6%) and 193 girls (48.4%). 35 cases were dropped from the original 434 eligible youth interviewed, because of missing data for the Parental PTSD variable. Missing data were investigated to see if missing data are related to observed variables and missing data was determined to be missing at random, therefore analysis proceeded using all available data (Full Information Maximum Likelihood)(Oshri, Rogosch, & Cicchetti, 2013). Ages 10-12 comprised 45.2% and ages 13-15 comprised 54.8% of the sample, with mean age 12.8 (SD=1.8). Table 12 presents the characteristics of all variables used in this study by sex. Total number of trauma exposure events experienced averaged 2.3 (SD=2.0). There were no significant differences by sex in use of coping strategies, and the most commonly used coping strategy, among both boys and girls, was avoidance. There were no significant differences by sex in internalizing problems (mean=1.25) or externalizing problems (mean=1.19), however somatic complaints were significantly higher among girls (β=0.14, p=0.001). Levels of happiness and hope were similar for both boys and girls, however, girls reported lower self-esteem than boys (β=-0.27, p=0.022). There were no significant differences

between girls and boys in respect to external factors. The median household size is 5 persons. Of the 399 caregivers included in this analysis 349 (85.5%) were female and 50 (12.5%) were male.

Table 12. Descriptive Statistics for measured variables included in SEMs

	Male	Female			Total
	Mean (SD)	**Mean(SD)**	**B**	**p**	**Mean (SD)**
Total Trauma Exposure	2.19 (2.05)	2.39 (2.04)	0.19	0.343	2.29 (2.04)
Coping Strategy	**Mean (SD)**	**Mean (SD)**	**B**	**P**	**Mean (SD)**
Problem Focused	0.15 (0.35)	0.09 (0.28)	-1.78	0.076	0.12 (0.32)
Emotion Focused	0.14 (0.21)	0.16 (0.25)	0.83	0.406	0.15 (0.23)
Avoidance	0.18 (0.39)	0.23 (0.40)	1.19	0.237	0.20 (0.39)
Faith	0.09 (0.30)	0.10 (0.30)	1.32	0.188	0.10 (0.30)
Total	0.55 (0.62)	0.58 (0.65)	0.45	0.656	0.56 (0.63)
Psychosocial Distress	**Mean (SD)**	**Mean (SD)**	**B**	**P**	**Mean (SD)**
Internalizing Problems	1.24 (0.23)	1.27(0.29)	0.03	0.311	1.25 (0.26)
Externalizing Problems	1.19 (0.20)	1.20 (0.22)	0.01	0.510	1.19 (0.21)
Somatic Complaints	1.37 (0.41)	1.51 (0.49)	0.14	**0.001****	1.44 (0.45)
Well-Being Measures	**Mean (SD)**	**Mean (SD)**	**B**	**P**	**Mean (SD)**
Happiness	2.95 (0.60)	2.91 (0.63)	-0.04	0.508	2.93 (0.61)
Self-Esteem	7.71 (1.12)	7.44 (1.31)	-0.27	**0.022***	7.58 (1.22)
Hope	2.29 (0.36)	2.23 (0.41)	-0.59	0.111	2.26 (0.38)
External Factors	**Mean (SD)**	**Mean (SD)**	**B**	**P**	**Mean (SD)**
Closeness to friends	3.53 (0.62)	3.47 (0.72)	0.92	0.632	3.50 (0.67)
Closeness to family	3.70 (0.55)	3.70 (0.54)	1.01	0.983	3.70 (0.55)
Parental PTSD	1.88 (0.49)	1.88 (0.50)	0.00	0.993	1.88 (0.50)
Home Violence	3.33 (1.65)	3.48 (1.88)	0.15	0.368	3.40 (0.565)
Village Violence	1.76 (0.97)	1.82 (0.96)	0.05	0.594	1.79 (0.96)
Enrolled in School	0.90 (0.30)	0.88 (0.33)	0.80	0.475	0.89 (0.31)

SEM Models

SEM Models tested the relationship between total trauma exposure, coping strategy use (problem focused, emotion focused, problem*emotion focused, avoidance and faith and psychological distress (internalizing problems, externalizing problems and somatic complaints) and well-being (happiness, self-esteem and hope) and external factors (closeness to peers and family, enrollment in school, Parental PTSD, home violence and village violence). A combined SEM model (both girls and boys) did not fit these data and indicated the need to fit models by sex. Modification indices indicated different structural paths and covariances were specific to boys and girls. Findings for girls and boys are presented in Figures 6 and 7, respectively. The structural model demonstrated good fit to the data for both girls ($X^2(95)=119.48$ $p<0.045$; $X^2/df=1.25$; RMSEA=0.037; CFI=0.94; TFI=0.91; SRMR=0.050) and boys ($X^2(93)=117.980$ $p<0.041$; $X^2/df=1.26$; RMSEA=0.036; CFI=0.94; TFI=0.92; SRMR=0.051) (Table 13). Standardized loadings on the latent factor for psychological health ranged from 0.59 – 0.81 (all $p<0.0001$) and for the latent factor well-being from 0.40-0.66 (all $p<0.0001$). The SEM model for boys explained 25% of the variance in psychological distress for boys, 49% of the variance in well-being and 58% of the variance in the overall model. The SEM model for girls explained 25% of the variance in psychological distress, 35% of the variance in well-being and 39% of the variance overall.

Table 13. Model Fit Indices for structural equation model of psychological distress and well-being

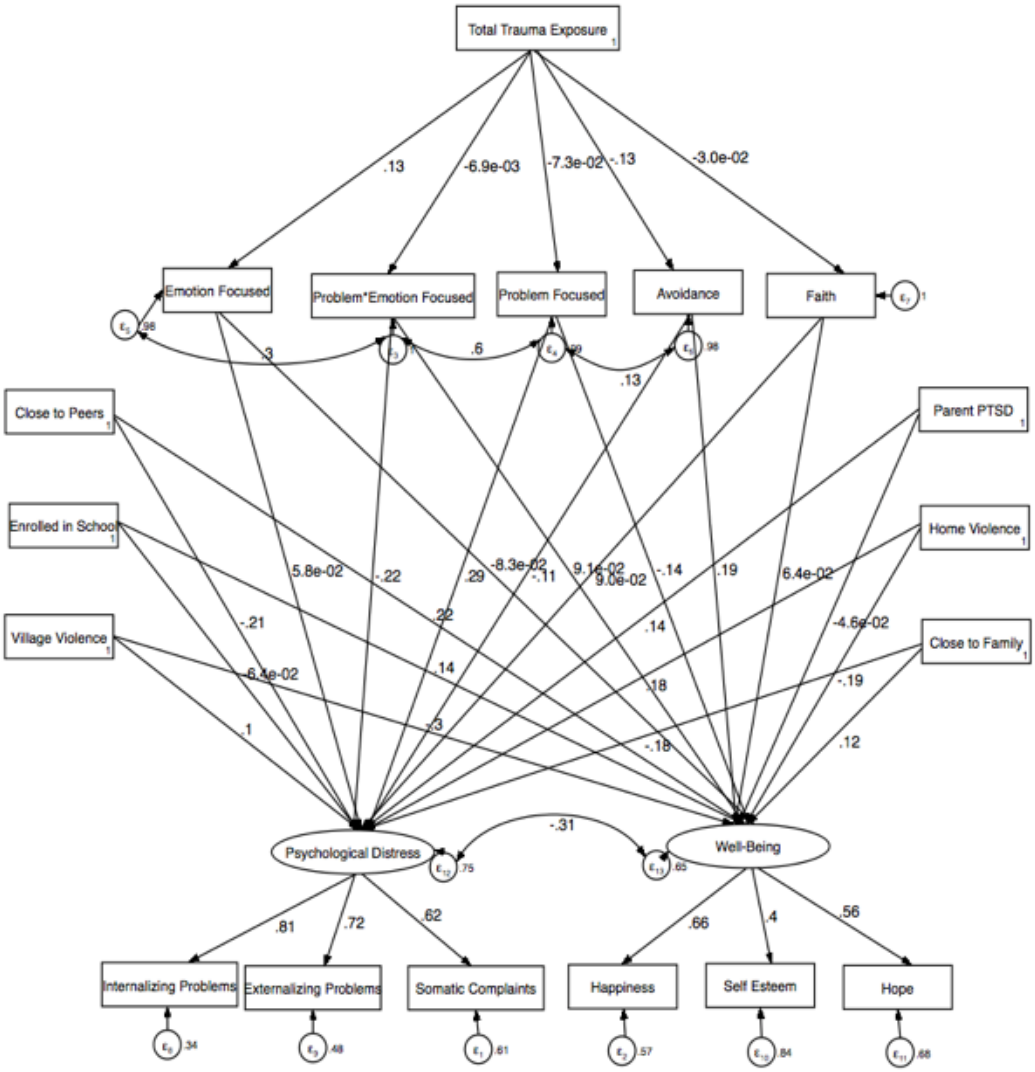
	Chi Square						
SEM Model	X^2	(df)	p	CFI	TLI	RMSEA	SRMR
Girls	119.48	95	0.045	0.94	0.91	0.037	0.050
Boys	117.980	93	0.041	0.94	0.92	0.036	0.051

Note. RMSEA= root mean square error of approximation; CFI=Bentler's comparative fit index; TLI=the Tucker Lewis index; SRMR=the standardized root mean residual

Table 14 presents the standardize path coefficients and p-values for girls in the SEM model and Table 15 Presents the standardized path coefficients and p-value for boys. Correlation between the latent factors psychological distress and well-being were significant for both boys (β=-0.33, p=0.014) and girls (β=-0.31, p=0.009). Correlation between problem focused and avoidance coping strategy was significant for girls (β=-0.13, p=0.024). Correlation between emotion focused and faith based coping strategies was significant for boys (β=-0.18, p=0.008)

Girls exposed to greater trauma used more emotion focused coping (β=0.13, p<0.0001) and less avoidance coping (β=0.13, p=0.025). Problem focused coping increased psychological distress in girls (β 0.29, p=0.003) but when problem focused coping was used with emotion focused coping the result was less psychological distress (β=-0.22, p=0.016). Avoidance coping increased well-being in girls (β=0.19, p=0.029). Feeling close to peers significantly reduced psychological distress (β=-0.211, p=0.49) and increased well-being (β=0.22, p=0.046) in girls. Girls who felt their home was not safe from violence had increased psychological distress (β=0.18, p=0.018) and lower well-being (β=-0.19, p=0.048). Girls of parents with higher PTSD scores experienced more psychological distress (β=0.14, p=0.014). Girls who felt their village was more violent had lower well-being (β=-0.30, p=0.025) and girls who attended school had significantly higher well-being (β=0.14, p=0.037).

Figure 6. SEM Resilience Model for Girls



Note: Standardized coefficients are displayed.

Table 14. Standardized path coefficients associated with psychological distress and well-being among trauma-affected girls

Structural Paths	Coefficient	SE	Z	p>|z|	95% Confidence Interval Lower Bound	Upper Bound
Problem Focused <-						
Child Trauma Total	-0.07	0.06	-1.21	0.226	-0.19	0.05
Emotion Focused<-						
Child Trauma Total	0.13	0.03	3.90	**<0.001*** **	0.07	0.20
Avoidance <-						
Child Trauma Total	-0.13	0.06	-2.25	**0.025***	-0.25	-0.02
Faith <-						
Child Trauma Total	-0.03	0.08	-0.38	0.704	-0.19	0.13
Problem*Emotion Focused <-						
Child Trauma Total	-0.01	0.05	-0.13	0.894	-0.11	0.09
Psychological Distress <-						
Problem*Emotion	-0.22	0.09	-2.40	**0.016***	-0.41	-0.04
Problem Focused	0.29	0.10	2.93	**0.003****	0.10	0.49
Emotion Focused	0.06	0.06	0.93	0.354	-0.06	0.18
Avoidance	-0.11	0.11	-0.95	0.340	-0.33	0.11
Faith	0.09	0.06	1.40	0.162	-0.04	0.22
Closeness to family	-0.18	0.18	-1.01	0.312	-0.53	0.17
Village violence	0.10	0.08	1.23	0.217	-0.06	0.27
Closeness to friends	-0.21	0.11	-1.97	**0.049***	-0.42	0.00
Home violence	0.18	0.07	2.37	**0.018***	0.03	0.32
Parent PTSD Mean	0.14	0.06	2.46	**0.014***	0.03	0.25
School	-0.06	0.07	-0.88	0.378	-0.21	0.08
Well-Being<-						
Problem*Emotion	0.09	0.12	0.75	0.454	-0.15	0.33
Problem Focused	-0.14	0.13	-1.06	0.291	-0.40	0.12
Emotion Focused	-0.08	0.06	-1.39	0.165	-0.20	0.03
Avoidance	0.19	0.09	2.22	**0.027***	0.02	0.36
Faith	0.06	0.14	0.45	0.654	-0.22	0.34
Closeness to family	0.12	0.12	1.02	0.305	-0.11	0.35
Village violence	-0.30	0.13	-2.24	**0.025***	-0.56	-0.04
Closeness to friends	0.22	0.11	2.00	**0.046***	0.00	0.44
Home violence	-0.19	0.10	-1.98	**0.048***	-0.38	0.00
Parent PTSD Mean	-0.05	0.14	-0.33	0.743	-0.32	0.23
School	0.14	0.07	2.09	**0.037***	0.01	0.27

p*<0.05 **p<0.01 ***p<0.001

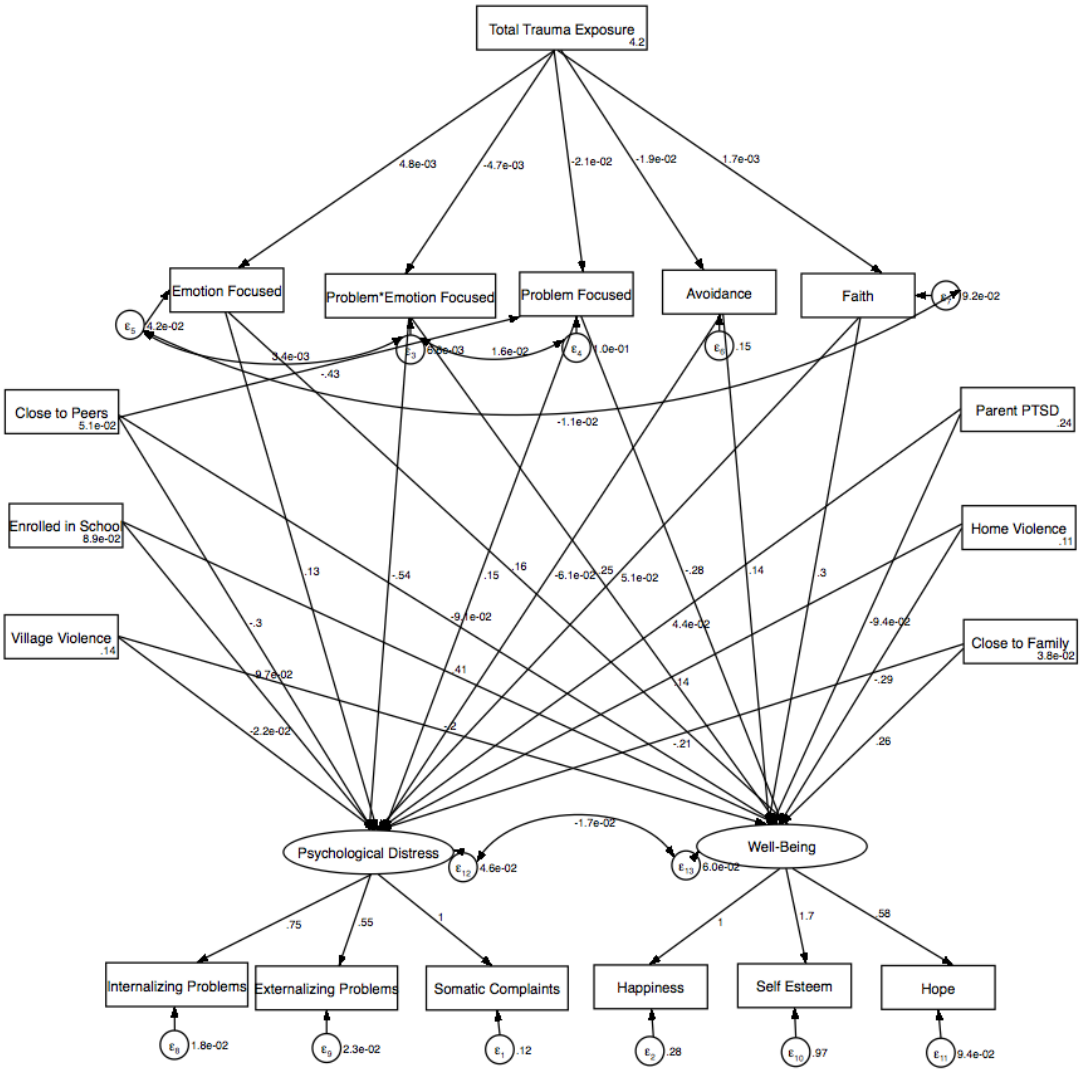
Note: Standard error adjusted for 10 village clusters

Boys exposed to greater trauma used more combined problem and emotion focused coping (interaction effect) (β=-0.005, p=0.021). For boys, use of problem focused coping increased psychological distress (β=0.15, p=0.021) and decreased well-being (β=-0.28, p<0.0001). Boys who used avoidance coping had better well-being (β=0.14, p=0.007) and marginally lower psychological distress (β=-0.06, =0.090). Boys who used faith based coping had greater well-being (β=0.30, p=0.001). Boys who felt closer to peers had lower psychological distress (β=-0.30, p=0.027). Boys who felt close to their family had greater well-being (β=0.26, p=0.038). Boys who felt their home

was not safe from violence had greater psychological distress (β=0.14, p=0.007) and lower well-being (β= -0.28, p=0.044). Boys enrolled in school had improved well-being (β=-0.35, p=0.001).

Correlation residual matrixes for both girls (Table 16) and boys (Table 17) revealed most residuals below the limit of 0.10. Only the residual correlation between total trauma and self-esteem was above this cut off value for boys (0.25) and girls (0.15).

Figure 7. SEM Resilience Model for Boys



Standardized coefficients are displayed.

Table 15. Standardized path coefficients associated with psychological distress and well-being among trauma-affected boys

Structural Paths	Coefficient	SE	Z	p>|z|	95% Confidence Interval	
					Lower Bound	Upper Bound
Problem Focused <-						
Child Trauma Total	-0.13	0.06	-2.04	**0.041***	-0.25	-0.01
Closeness to peers	-0.29	0.05	-6.18	0.000	-0.39	-0.20
Emotion Focused<-						
Child Trauma Total	0.05	0.07	0.69	0.493	-0.09	0.19
Avoidance <-						
Child Trauma Total	-0.10	0.07	-1.44	0.149	-0.23	0.04
Faith <-						
Child Trauma Total	0.01	0.08	0.14	0.885	-0.15	0.17
Problem*Emotion Focused <-						
Child Trauma Total	-0.12	0.05	-2.52	**0.012***	-0.21	-0.03
Psychological Distress <-						
Problem*Emotion	-0.18	0.11	-1.62	0.106	-0.40	0.04
Problem Focused	0.20	0.10	2.06	**0.040***	0.01	0.40
Emotion Focused	0.11	0.09	1.20	0.230	-0.07	0.28
Avoidance	-0.10	0.06	-1.63	0.103	-0.21	0.02
Faith	0.06	0.08	0.82	0.412	-0.09	0.21
Closeness to family	-0.16	0.12	-1.40	0.162	-0.39	0.07
Village violence	-0.03	0.06	-0.59	0.557	-0.15	0.08
Closeness to friends	-0.27	0.10	-2.82	**0.005****	-0.46	-0.08
Home violence	0.19	0.08	2.36	**0.018***	0.03	0.34
Parent PTSD Mean	0.09	0.12	0.76	0.450	-0.14	0.32
School	-0.12	0.07	-1.76	0.079	-0.25	0.01
Well-Being<-						
Problem*Emotion	0.06	0.06	0.94	0.346	-0.06	0.18
Problem Focused	-0.27	0.08	-3.28	**0.001****	-0.44	-0.11
Emotion Focused	0.10	0.11	0.90	0.368	-0.11	0.31
Avoidance	0.16	0.06	2.78	**0.005****	0.05	0.28
Faith	0.26	0.07	3.60	**<0.001*****	0.12	0.41
Closeness to family	0.15	0.06	2.46	**0.014***	0.03	0.27
Village violence	-0.22	0.16	-1.44	0.151	-0.53	0.08
Closeness to friends	-0.06	0.05	-1.25	0.210	-0.15	0.03
Home violence	-0.28	0.14	-2.01	**0.044***	-0.54	-0.01
Parent PTSD Mean	-0.14	0.10	-1.32	0.185	-0.34	0.06
School	0.36	0.11	3.29	**0.001****	0.14	0.57

p*<0.05 **p<0.01 ***p<0.001

Note. Standard error adjusted for 10 village clusters

Table 16. Correlations between item residuals for girls

Number	Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Problem* Emotion	0.00																	
2	Problem Focused	0.00	0.00																
3	Emotion Focused	0.00	0.01	0.00															
4	Avoidance	0.01	0.01	0.01	0.00														
5	Faith	0.00	-0.01	0.01	-0.01	0.00													
6	Somatic	0.00	0.01	0.00	0.02	0.00	0.00												
7	Internalizing	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
8	Externalizing	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00										
9	Happy	0.00	-0.02	0.00	-0.02	-0.01	-0.01	-0.01	0.00	0.00									
10	Esteem	0.01	0.04	0.04	0.07	0.06	0.08	0.00	0.01	-0.03	0.00								
11	Outlook	0.00	0.01	0.00	0.00	0.00	-0.01	0.01	0.01	0.01	-0.01	0.00							
12	Close to Family	0.00	0.00	0.00	-0.01	0.00	0.01	0.00	0.00	0.00	-0.02	0.00	0.00						
13	Village	0.00	0.00	-0.01	0.00	-0.01	0.00	0.00	-0.01	0.02	-0.02	-0.01	0.00	0.00					
14	Child Trauma Number	0.00	0.00	0.00	0.00	0.00	0.08	0.07	0.00	-0.10	**-0.15**	-0.07	0.00	0.00	0.00				
15	Close to Peers	0.00	-0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	-0.01	0.00	0.00	0.00	0.00			
16	Home violence	0.00	-0.01	-0.01	0.00	0.00	-0.01	0.00	0.00	0.00	0.05	-0.01	0.00	0.00	0.00	0.00	0.00		
17	Parent PTSD	0.00	0.00	0.00	0.01	0.00	-0.02	0.00	0.00	0.02	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	
18	School	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.07	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. Residuals>.10 in boldface.

Table 17. Correlations between item residuals for boys

Number	Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Problem* Emotion	0.00																	
2	Problem Focused	0.00	0.00																
3	Emotion Focused	0.00	0.00	0.00															
4	Avoidance	0.00	0.02	0.01	0.00														
5	Faith	0.00	-0.01	0.00	-0.01	0.00													
6	Somatic	0.00	-0.02	-0.01	-0.01	-0.01	0.00												
7	Internalizing	0.00	0.00	0.00	0.00	0.00	0.00	0.00											
8	Externalizing	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00										
9	Happy	0.00	-0.01	-0.01	-0.02	0.01	-0.02	-0.01	0.00	0.00									
10	Esteem	0.00	0.01	0.02	-0.02	0.02	-0.02	0.02	0.00	-0.05	0.00								
11	Outlook	0.00	0.01	0.00	0.00	-0.01	-0.01	0.01	0.00	0.02	-0.01	0.00							
12	Close to Family	0.00	-0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.01	0.00	-0.01	0.00						
13	Village	0.00	-0.01	0.00	-0.01	-0.01	0.02	0.00	0.00	0.02	-0.05	0.00	0.00	0.00					
14	Child Trauma Number	0.00	0.00	0.00	0.00	0.00	0.04	0.05	-0.04	-0.07	**0.22**	-0.05	0.00	0.00	0.00				
15	Close to Peers	0.00	0.00	0.01	-0.01	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00			
16	Home violence	0.00	-0.01	0.00	0.00	0.00	0.01	0.00	-0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00		
17	Parent PTSD	0.01	0.01	0.00	0.03	0.02	-0.02	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
18	School	0.00	0.00	0.00	0.01	0.00	0.01	0.00	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Note. Residuals>.10 in boldface

Discussion

The purpose of this study was to understand how individual level coping strategies combined with variables at the peer, family and community level impact youth psychological distress and well-being. The aim of fitting structural equation models was to explain the covariance structure of all included variables, in order to understand pathways between exposure to potentially traumatic events as a risk factor; protective and promotive factors across socio-ecological levels (individual coping strategies, peer, family and community relationships); and outcomes of psychological distress and positive indicators of well=being. A combined SEM model (both girls and boys) did not fit these data and indicated the need to fit models by sex. Parameter loading by sex and overall covariance model fit differ by sex. Modification indices indicated different structural paths and covariances were specific to boys and girls.

For girls, there was a statistically significant correlation between problem focused and avoidance coping strategies. For boys, there was a statistically significant correlation between emotion focused and faith based strategies. In addition, examination of modification indices suggested a strong and significant relationship between positive peer relationships and problem focused strategies in boys. Boys that felt closer to friends used less problem focused strategies than boys who felt more distant from peers. This result suggests that peer relationships may support more use of other coping strategies such as avoidant (distracting oneself in play with peers) or emotion focused strategies (seeking social support to feel better).

Use of problem focused coping strategies worsened psychological distress in both boys and girls. An explanation for the negative association between problem-focused coping strategies and mental health may be the methods or behaviors employed to "fix a problem." Research suggests that without effective emotional regulation, trauma affected children may exhibit increased aggressive behavior (Pat-Horenczyk et al., 2014) Therefore it is plausible that some of the problem focused strategies employed by youth may be harmful. Another possibility is that without use of emotion focused coping, youth lack the psychological strength to make a problem focused strategy effective.

When girls utilized both problem and emotion focused strategies the result was a reduction in distress. This finding suggests that problem focused strategies that include an emotion focused component can be particularly effective, but that emotional support is critical to the effect of using a problem focused strategy. Previous research indicates that rather than focusing on the independent effect of a particular strategy, considering how strategies are used simultaneously may be informative. (Ellen A Skinner et al., 2003). Effective emotion focused coping has been shown to reduce distress and provide a calmer approach to problem solving (Weinberg, Gil, & Gilbar, 2014).

In both boys and girls, use of avoidant strategies improved well-being, though the total effect was slightly higher in girls. In boys, use of faith-based strategies also improved well-being. Avoidance coping strategies that seek to "just forget it" or distract oneself may be particularly suitable in context of ongoing conflict or contexts with profound limitations on the ability of an individual to engage with or "fix" their stressor. Some research suggests that avoidant coping strategies may be more adaptive in the short term but less adaptive in the long term (Fonagy & Target, 2003; Kerig et al., 2010; Van der Kolk, 1996). While avoidant coping may be appropriate immediate response to stress, other coping strategies or groups of strategies may be critical, particularly as youth get older and have more responsibilities.

Investigation of external factors particular to one's social ecology, including relationships and safety in the home and community and engagement with peers and institutions like school inform a more nuanced understanding of youth resilience to stress. Particularly for girls, home environment, parental mental health and relationships with the family had a significant impact on psychological distress. Adults suffering from mental health disorders may not have the capacity to assist children and provide support (Belter & Shannon, 1993; La Greca, Silverman, Vernberg, & Roberts, 2002). Caregivers that are unable to be supportive to youth can result in increased child distress and development of emotional suppression (Pat-Horenczyk et al., 2014), deficits in emotion understanding (Pears & Fisher, 2005), and less adaptive coping strategies (Compas et al., 2001). While the family environment impacted both boys and girl's well-being measures, these data suggest that

girls are impacted more by their parent's PTSD than boys. Girls spending more time in the home and having greater interaction with their parent/caregiver than boys, may make them more vulnerable to poorer parent/caregiver mental health. The majority of caregivers in this analysis were women and women are more likely to have PTSD than men in humanitarian settings.

Peer relationships significantly reduced psychological distress for both boys and girls and increased well-being in girls. Attending school improved well-being for both boys and girls, although the main effect on well-being was more than twice as high for boys. At the community level, feeling their village was not safe impacted psychological health among girls but not boys. Furthermore, this factor had the greatest negative effect on girl's well-being in comparison with all other factors evaluated. Boys, may be more likely to engage in activities outside the home and have greater confidence in their ability to navigate threats and therefore suffer less direct psychological distress resulting from fear of community violence.

These results reflect context specific effects related to gender equity. Girls have more limited freedom outside the home and greater responsibility within the household. In contrast, boys have greater freedom to interact with peers and community members outside the home. This reality may limit the types of coping strategies girls learn and use and limit the gains received through employment of simultaneous coping strategies and coping flexibility. Peers and community members can be an important source of teaching coping skills and can be a healthy influence on mental health and well-being outside of the home.

Synthesis and Contribution

Results from these studies contribute to current research on coping and resilience among conflict-affected youth. The qualitative study provides insight into how youth define their sources of stress and coping strategies. Youth interviews revealed a significant amount of traumatic stress from violence in the home and community. Some of these stressors were directly experienced and some were believed to exist even if unverified. The second manuscript

provided a quantitative evaluation of types of potentially traumatic events experienced over the lifetime. These experiences were grouped under five sub-types; material deprivation, coercion, combat, witnessing violence to others and bodily injury. Material deprivation was the most commonly experienced potentially traumatic event. Older ages reported having experienced more of each trauma type and age and total trauma exposure were highly correlated with additional age significantly related to having experienced more trauma. The third manuscript included additional sources of stress such as feeling the village or home was not safe. Results from the structural equation models revealed that home environment and caregiver health have a greater impact on psychological distress than well-being, while peer relationships, community relationships and enrollment in school benefited well-being. From the qualitative study it's possible that some of the perception that the village is not safe may be supported through collective belief gleaned through story-telling among peers. Involving youth in more activities in the community and outside of the home could help to dispel superstitions and promote engagement with healthy community members. In addition to the potentially traumatic events youth have encountered over their life time, the qualitative and quantitative analysis highlights the importance of peer, family and community relationships in impacting mental health and well-being.

The qualitative study revealed how youth define their approaches to coping with stress. These strategies included "trying to forget" or avoidance of stressful events, prayer, social support seeking and risk taking behaviors. The quantitative studies revealed that youth endorsed "trying to forget" and "prayer" as the most commonly endorsed coping responses in the adapted KidCope, confirming the results from the qualitative study. Previous research in the DRC and this qualitative study support the hypothesis that in contexts of humanitarian emergencies conflict-affected youth may prefer to use coping strategies such as avoidance and emotion-focused strategies, and these strategies may be a beneficial response to stress. This study also

confirmed that problem focused coping is used less often than emotion focused or avoidance strategies among youth in the DRC. The quantitative analysis in manuscripts two and three support this finding. A synthesis of how youth coping strategies were associated with psychological health and well-being is presented in Table 18.

Table 18. Synthesis of Coping Strategies and Associations with Mental Health Outcomes by Gender

	Psychological Distress		Well-Being	
	Internalizing Problems	Externalizing Problems	Pro-social Behavior	Self Esteem
Problem-Focused	+ +	+ +	- -	-
Emotion-Focused	-			+
Avoidance	-	-		+
Faith			+	+ +
Problem*Emotion Focused	-	- -		

Note. + association in girls; + association in boys; - association in girls; - association in boys

The quantitative results suggest that use of problem focused coping reduces increases psychological distress for unless youth also use emotion focused coping and thereby have demonstrated, "coping flexibility". Research suggests that problem focused coping may be employed with other strategies in a cyclical way so that avoidant coping provides the reprieve necessary regain emotional strength to make problem focused strategies successful (Ellen A Skinner et al., 2003). Emotion focused coping increased self esteem in girls. Avoidance increased self-esteem in girls and reduced internalizing and externalizing problems. Faith based coping increased prosocial behavior in boys, and self-esteem in both boys and girls. This is an important result because faith based coping has the potential to increase positive aspects of well-being, which some suggest is more difficult to affect than decreasing symptoms (M. J. Jordans, Tol, Ndayisaba, & Komproe, 2013; Stice, Shaw, Bohon, Marti, & Rohde, 2009).

The third manuscript supports and is consistent with the finding that use of multiple strategies can be effective and that there exists correlation among coping strategies such as the use of both problem-focused and avoidant strategies among girls. These results highlight the importance of coping flexibility, that is use, of multiple or grouped strategies. In particular, use of both emotion focused and problem focused strategies may be impactful in protecting against psychological distress and promoting well-being. While the second paper examines this finding from a regression approach, the third confirms the results through an SEM approach, strengthening the validity of these findings from a statistical perspective.

These studies indicate relationships between coping strategies and mental health and well-being vary by gender. For example, the second manuscript revealed that avoidant strategies were marginally associated ($p=0.055$) in lower internalizing problems in girls but not boys. In addition, use of both problem focused and emotion focused strategies was important in reducing externalizing problems in girls but not boys. Use of emotion focused strategies was important in improving self-esteem in boys but not girls, and use of avoidance was associated with higher self-esteem in girls but not boys. These findings suggest that girls and boys coping strategies impact their mental health and well-being in different ways. The third manuscript supported this finding. Structural equation models seeking to fit the covariance structure of all variables revealed that optimal fit was achieved only by modeling the SEM separately for boys and girls. Differences in correlation between coping strategies revealed that while girls had significant correlation between problem focused and avoidance strategies, boys had significant correlation between emotion focused and faith-based strategies.

Results from the structural equation model analysis reveal the importance of external factors in impacting mental health. These results are summarized in Table 19. The home environment including closeness to family, caregiver PTSD and violence was associated with psychological distress and well-being. Peer relationships, village safety and enrollment in school

benefited well-being. Caregiver PTSD increased psychological distress in girls but not boys. Enrollment in school is important to well-being of both boys and girls and increasing enrollment and regular attendance is particularly beneficial to youth well-being. These results echo qualitative results that highlight the importance of peer, family and community relationships.

Table 19. Synthesis of External Factors and Associations with Mental Health Outcomes by Gender

	Psychological Distress	Well-Being
Closeness to Friends	- -	+
Closeness to Family		+
Home Violence	++	- -
Caregiver PTSD	+	
Village Violence		-
Enrollment in School		++

Note. + association in girls; + association in boys; - association in girls; - association in boys

Implications for Interventions

Results from these studies are important to intervention planning. The ability to deal with stressors whether they are potentially traumatic events or every day stress is critical for youth mental health, development and functioning. Understanding the complexity of coping among conflict-affected youth in the context of the DRC helps develop a more complete theory of cognitive and behavioral coping strategies. These coping strategies can be used for empirical testing of promotive and protective paths that benefit mental health. Integrating external factors at the peer, family and community levels provides evidence for multi-level intervention approaches that can be more effective in improving mental health among conflict-affected youth and securing a brighter future for families and communities.

Interventions targeting promotion of mental health resilience have sought to capitalize on and manipulate protective and promotive pathways to improve mental health. Interventions

can be promotive such as including activities that strengthen positive aspects of well-being, prevention focused such as activities aimed at reducing mental health problems and addressing determinants of mental health or treatment focused such as activities to reduce symptoms and improve functioning(M. J. Jordans, Pigott, & Tol, 2016). Strategies also consider both short and long term opportunities to prepare and protect individuals and communities (Masten & Narayan, 2012). A review of mental health interventions for youth affected by armed conflict is presented in Table 20. Youth interact with their particular social ecology, and interventions should target various relationships in that social ecology. Almost all interventions that have been implemented have been group based and delivered through schools and a few have included family and community components (Dybdahl, 2001; Kennedy, Fonner, O'Reilly, & Sweat, 2013; O'Callaghan et al., 2014). A recent meta-analysis of interventions among conflict-affected children found that the most frequently mentioned intervention modalities were creative expressive, psycho educational and cognitive behavioral strategies (M. J. Jordans et al., 2016).

Table 20. Mental health resilience interventions for conflict-affected youth

Author	Country	Level	Intervention Type	Key Findings
Ager, 2011	Uganda	School	School based intervention to enhance coping, self-esteem and future planning through play therapy	Significant improvement in well-being with girls making greater progress than boys and older children making greater progress than younger children
Barron, 2012	Palestine	School	School based TF-CBT	Significant decrease in depression, PTSS and emotion and behavioral issues
Betancourt, 2012	Uganda	Peer/Community	Group based Interpersonal psychotherapy and creative play interventions.	Significantly reduced depression in males and females with a history of abduction
Claessens, 2012	Uganda	School	School based recreational and connectivity exercises	Improved relationship building and improved well-being
Diab, 2014	Palestine	School	School based psychosocial intervention based on Teaching Recovery Techniques	Intervention decreased mental health problems and improved peer relationships.
Diab, 2015	Palestine	School	School based TF-CBT	Did not increase resilience but improved peer relationships and sibling relationships
Dybdahl, 2001	Bosnia-Herzegovina	Family	Psychosocial intervention with	Positive effect on maternal mental health, child weight gain and child

			mothers	psychosocial functioning
Eiling, 2014	South Sudan	School	School based recreational and connectivity exercises	Decreased fighting and improved relationships
Gelkopf, 2009	Israel	School	School based intervention aimed at improving coping skills	Significantly lowered symptoms of PTSD, depression, anxiety, somatic complaints and improved functioning
Hasanovic, 2009	Bosnia and Herzegovina	School	School based psycho-educative and expressive classes	PTSS decreased significantly.
Jordans, 2010	Nepal	School	School-based creative expressive focused CBT with trauma focus	No main effects found but subgroup effects on prosocial behavior, hope and aggression.
Jordans, 2013	Burundi	Community	Community based counseling focus on individual empowerment	Reduced aggression among boys; no impact on depressive symptoms
Karam, 2008	Lebanon	School	CBT and stress inoculation training	No significant effect for MDD, anxiety or PTSD
Khamis, 2004	Palestine	School	School based psychosocial intervention to enhance coping, pro-social behavior	Intervention group had positive impact on psychological symptoms, aggression and behavioral problems CBI had a more positive effect on adolescent girls than boys
Lange-Nielson, 2012	Gaza	School	Short term writing intervention	Mixed effects of increase and decrease in symptoms over time
McMullen, 2013	Democratic Republic of Congo	Peer	Group-based, CBT intervention	Intervention group had lower PTSD, depression, anxiety symptoms and increased prosocial behavior.
O'Callaghan, 2013	DRC	Community	Community based trauma focused CBT incorporating coping and processing skills	Significant decrease in PTSS, depression and anxiety.
O'Callaghan, 2014	DRC	Community	Community based psycho-educative classes with focus on communication and resolution	Moderate reduction in PTSS, depression and anxiety
Punamaki, 2014	Palestine	School	School based TF-CBT	Not effective in changing emotion regulation, a decrease in ER was associated with better mental health.
Quota, 2012	Palestine	After School	CBT, coping skills training, psycho-education	Reduced PTSD for boys, no effect for girls.
Staples, 2011	Palestine	Community	Community based traumatic grief psychotherapy	Reduced PTSS and depression
Thabet, 2009	Palestine	School	School-based psycho-educative focus on communication and resolution	Small reduction in behavior and depression.
Tol, 2010	Indonesia	School	School-based creative expressive techniques combining CBT	Increased social support and maintained hope. Girls showed larger treatment benefits in PTSS
Tol, 2012	Sri Lanka	School	School-based creative expressive techniques combining CBT	Main effect on conduct problems, negative results for girls PTSS
Tol, 2014	Burundi	School	School-based creative	No main effects.

			expressive techniques combining CBT	
Wolmer, 2011	Israel	School	School based psychosocial intervention and coping skills training	Significantly lowered symptoms of PTSD, effect was greater among boys than girls.

Understanding coping within the context of the DRC allows interventions to appropriately support those coping strategies that are effective in this context. Reliance on the western constructs of coping may inappropriately prioritize certain coping strategies as beneficial, such as engagement or problem-solving strategies, when these types of strategies may be of secondary concern or simply lacking meaning in this context. In addition to recognizing use of a particular strategy, this study identifies the possibility of overlap between coping domains and mutually reinforcing relationships between particular strategies that could potentially help youth.

Emotion focused coping strategies such as emotional regulation techniques or emotion expression may be beneficial. Weisz (1994) found that even in young children (ages 6-9), increased use of emotion focused coping in response to uncontrollable stressors reduced behavioral and emotional problems (Weisz et al., 1994) Additional research has shown that emotion focused strategies may lead to better psychological outcomes when compared to children who rely solely on problem focused strategies (Weisz et al., 1994).

There have been some studies that implemented interventions with a focus on emotion focused coping strategies. The Rational-Emotive Education Intervention developed by Vernon was a school based intervention for youth grades 1-6 to teach emotion education, problem solving skills and decision making (Vernon, 1983). Children learned how to identify negative feelings and change their thoughts, how to express emotions in positive ways and how to identify irrational thoughts. This intervention was positively related to pro-social behavior. A study with trauma affected youth in Israel, delivered a school-based intervention, the Coping Enhancement Protocol, and taught students techniques focused on emotion regulation, such as methods to regulate negative emotions, distracting thoughts and relaxation techniques

(awareness, muscle tension, breathing) as (Wolmer, Hamiel, & Laor, 2011). This intervention was effective in reducing PTSD. Another study with war-affected Israeli children developed the ERASE-Stress intervention, a school based intervention that sought to enhance emotional awareness and ways to express emotions to increase resilience (Gelkopf & Berger, 2009). This intervention was effective in reducing PTSD. Research suggests that even young children can be taught emotion focused coping skills and these skills would enhance their coping repertoires and ability to deal with stress (Pincus & Friedman, 2004).

Studies indicate that having a larger repertoire of coping skills can buffer the effect of traumatic stress on psychological health (Dubow, Tisak, Causey, Hryshko, & Reid, 1991). The results from both quantitative manuscripts indicate that problem focused coping when used with emotion focused coping can reduce internalizing and externalizing problems. This research supports previous findings that rather than focusing on improving a particular coping strategy, engagement of multiple or groups of strategies may be most efficacious as an adaptive response to stress. Interventions have been implemented that support multiple coping strategies. For example, emotion regulation interventions have sought to shift children's attention from fear-arousing issues, a type of avoidance strategy (distraction and redirecting) and also to control responses within a framework of trauma processing, emotional calming strategies (reframing and seeking social support) (Cole, Martin, & Dennis, 2004).

This research also indicates that girls and boy's use of coping strategies may have different associations with mental health and well-being measures. While interventions may not need to target boys and girls separately, the impact of these interventions may differ by sex. For example, girl's psychological distress was impacted by caregiver mental health, whereas boys were not. Interventions that include wellness of family members and involvement may be an important strategy to promote girl's mental health. Two longitudinal studies with war-affected youth in Afghanistan and Uganda found that negative parent-child interactions resulted in poor

mental health outcomes, while less exposure to domestic violence and better family socioeconomic situations led to fewer symptoms of psychopathology (Klasen et al., 2010; Panter-Brick, Goodman, Tol, & Eggerman, 2011). An intervention in Bosnia to promote mother and child interaction found the intervention reduced psychological symptoms (Dybdahl, 2001). A recent study in the DRC found that a family focused psychosocial intervention for conflict affected youth was successful in reducing post-traumatic stress and reduced conduct problems(O'Callaghan et al., 2014). Interventions should consider including a parent-child intervention focus. Furthermore, particularly for girls, providing opportunities to engage with healthy adults outside of the home may buffer the negative effects of poor caregiver mental health until those mental health needs can be fully addressed. For girls in this study, problem focused and avoidance coping strategies were significantly correlated. Research suggests that problem focused coping may be employed with other strategies in a cyclical way so that avoidant coping may provide the reprieve necessary regain emotional strength to make problem focused strategies successful (Ellen A Skinner et al., 2003).

For boys, emotion focused and faith based coping were significantly correlated. Religious institutions and religious youth groups may be an impactful source through which to deliver interventions. Churches may not only support faith based coping but may also provide a means for supporting emotional regulation and calming. Many youth in this study discussed singing a song to feel better. Youth choirs may be a way to not only support peer relationships but also an activity that can channel emotional expression. Research has provided evidence that use of religious songs can help manage stressful life events (Hamilton, Sandelowski, Moore, Agarwal, & Koenig, 2013). Boys also benefited from having close peer relationships. This finding is consistent with resilience research among conflict affected children. For example, a study in Palestine found that boys with higher quality friendships were more resilient to trauma exposure (Peltonen, Qouta, Diab, & Punamäki, 2014).

Interventions offering greater opportunity to form bonds with peers and the community may help to increase well-being. Schools are critical resource in contexts of humanitarian emergencies. In this study enrollment in school was effective at promoting well-being in both boys and girls. Schools provide a safe space but also promote social bonds with peers and with healthy adults in the community (teachers, youth group organizers). Research by Tol, 2010 investigating mediators between treatment and PTSD found that compared with waitlist group, children receiving a school based intervention had improved hope and positive coping, and girls, children in smaller households, and children receiving social support from adults outside the household were able to realize larger treatment benefits on functional impairment (Tol, Komproe, et al., 2010). Implementing programs in schools provides the possibility of having an impact on a range of youth with different exposures to trauma. Acquisitions of coping skills can not only benefit youth experiencing traumatic stress, but can also buffer the effects of trauma in the future.

Other intervention approaches may also effectively support positive coping in youth and address the effect of external factors on impacting mental health and well-being. In the qualitative study, many youth stated not having food and not being able to pay for school as daily stressors endured. The primary objective of most microfinance interventions is to increase individual ability to generate income and secure livelihoods. Microfinance includes a range of financial services including credit, savings, insurance and fund transfers given to individuals who would not normally receive financial opportunities from traditional institutions (Kennedy et al., 2013). Animal husbandry microfinance interventions that can provide income to youth may not only reduce daily stressors and improve mental health, but also support peer and community relationships, which can be an important source of emotional support that may bolster use of emotion focused strategies. Findings from Pigs for Peace, an animal husbandry microfinance intervention in the DRC found that animal/livestock assets moderated the effect of trauma on

mental health in adults (N. Glass et al., 2014). The microfinance intervention, Rabbits for Resilience (R4R) is an example of an animal husbandry intervention for youth that provides rabbits in the form of a loan to eligible youth. R4R promotes peer, family and community relationships – the systems that are crucial to support a child's mental health. Ungar argues that, "creating and sustaining facilitative environments for optimal child development requires that individuals and groups are empowered to negotiate for the adequate resourcing of the multitier systems that are supposed to be there to meet their individual and collective needs" (Ungar et al., 2013). By offering opportunity for individual skill building while also promoting family connectedness and improving social cohesion and collective unity, R4R addresses the multiple levels that promote resilience throughout the social ecological system.

Recent research has shown that cognitive behavioral therapy (CBT), particularly trauma focused cognitive behavioral therapy (TF-CBT) has been effective in treating youth mental health in conflict-affected contexts (McMullen et al., 2013; Murray et al., 2015; O'Callaghan, McMullen, Shannon, Rafferty, & Black, 2013; S. R. Qouta, Palosaari, Diab, & Punamaki, 2012). Important strengths of TF-CBT is that it can be delivered at the group level by nonclinical facilitators who are trained in culturally appropriate intervention methods (O'Callaghan et al., 2013). TF-CBT protocol often includes a focus on strengthening coping skills such as psycho-educational sessions (presentation of coping skills), interactive group activities (practicing coping skills), small group therapeutic processing (sharing coping reactions and how they influenced one's life)(Cox et al., 2007). Research among war-affected youth from Bosnia found that the most frequently identified benefit from TF-CBT interventions was the acquisition of coping skills and attitudes(Cox et al., 2007). TF-CBT has a growing evidence base supporting its effectiveness in low resource settings among trauma affected youth. For example, a study among trauma-affected youth in Zambia found that TF-CBT delivered in a low resource setting was effective in reducing trauma related stress symptoms and improving functional capacity (Murray

et al., 2015). Research among former child soldiers and war-affected boys in the DRC found that group TF-CBT interventions were effective in reducing posttraumatic stress symptoms, overall psychosocial distress, depression or anxiety symptoms, conduct problems and increased prosocial behavior (McMullen et al., 2013).

Delivering interventions at the group level can optimize use of limited resources, and working as a group can foster friendships, reduce stigma, promote understanding of symptoms and provide a sense of safety and emotional support. This research suggests that one of the means by which CBT therapy may be effective is that it is able to synergize emotion focused (cognitive) and problem focused (behavioral) strategies and exploit the benefits that are not necessarily received if one strategy is used by itself. TF-CBT delivered at a group level can provide emotional support networks and encourage sharing of emotions and trauma experiences, resulting in improvements in emotion focused coping strategies. For example, a TF-CBT intervention delivered to sexually exploited war-affected girls in the DRC found that some of the girls spontaneously formed smaller support groups to practice their relaxation and mental imagery techniques, skills that would fall under the emotion focused coping domain(O'Callaghan et al., 2013). If emotion focused coping strategies are improved through provision of TF-CBT, overall coping flexibility will likely improve and build the coping repertoire of youth.

The most effective intervention strategies may be one that combines the benefits of TF-CBT with animal husbandry microfinance interventions. TF-CBT can improve coping skills and is efficient if delivered at the group level. Animal husbandry microfinance interventions can support peer and community relationships while offering means to bolster economic stability and address daily stressors such as food and school fees. An approach that simultaneously helps to address past trauma and current stressors can be effective in supporting coping strategies and the socio cultural factors that impact mental health. Future research could benefit from a more

complex understanding of the relationships between coping strategies and potential reinforcing relationships between cognitive and behavioral strategies and external factors. It is possible that mental health and well-being impact not only coping strategies, but also the potential for future stress exposure. These kinds of reciprocal relationships are important to investigate in the future through longitudinal studies that investigate adaptive trajectories. Future research should continue to seek context specific understandings of youth mental health resilience in order to best tailor strategies to target and exploit promotive and protective paths to improved mental health.

Limitations

First, only self-reported measures of all variables included were present. While youth have reported feeling comfortable with Congolese interviewers in the past, responses could be impacted by perceived desirability of response choices. Including reports from parents, peers or teachers could benefit future research and allow for triangulation of measures.

Second, the adapted coping instrument may be context specific. Results from this study may not be generalizable to other contexts as coping strategies were defined within the cultural context of the Walungu Territory in Eastern Democratic Republic of Congo. The villages sampled in this study were rural villages and coping strategies in urban contexts may differ if additional resources and support systems specific to urban environments are available. The youth included in this study had a wide range of trauma exposure related to ongoing-armed conflict and it is possible that coping strategies change over time post-conflict. Future research and public health programming should consider adaptive trajectories over time.

Third, results from the second manuscript found that the R^2 for outcomes indicates that coping strategy explains between 5.7-21.7% of the variation in internalizing and externalizing

problems and 6.9-16.7% of the variation in well-being measures. While these R^2 values fail to explain a significant proportion of the variance, they are similar to R^2 indices reported by previous research (Elklit et al., 2012; S. Holen, Lervag, Waaktaar, & Ystgaard, 2012; Kuterovac-Jagodic, 2003; Pat - Horenczyk et al., 2009). The R^2 values indicate that coping strategies alone explain a small proportion of the variance in internalizing and externalizing problems and well-being measures, indicating that other factors both internal and external to youth's lives may be important to investigate.

Fourth, the cross-sectional design of this study did not allow for causal conclusions, that is, it is possible that there are reciprocal relationships occurring between stress, coping and mental health and well-being outcomes. For example, youth with high levels of internalizing and externalizing problems may use particular coping strategies more and may be at greater risk for further traumatic stress. This research is limited to youth ages 10-15, and coping strategies that are used and their effectiveness may differ in young children and adults. Furthermore, longitudinal studies are needed to explore how coping strategies impact mental health and well-being over time. Future research should consider whether coping strategies are particularly impactful during a developmental age range, or whether those strategies remain as assets over the life course. To better understand these complex relationships, longitudinal studies are necessary.

Fifth, while external factors at the peer, family and community level help explain a resilience framework for mental health and well-being, additional variables and more nuanced scales to represent those variables could be useful. For example, understanding types of peer relationships in greater detail may help to inform an understanding of how behaviors undertaken in friendship circles may help or hinder mental health resilience. Combining these data with more objective behavioral data would make the reliability of these data more robust. Despite

these limitations, this study has practical implications that contribute to understanding youth coping and impacts on mental health and well-being.

Conclusion

This research provides a culturally specific portrait of youth coping in conflict-affected Walungu Territory, Eastern Democratic Republic of Congo. This study provides an in depth analysis of youth coping strategies on mental health and well-being outcomes. Four types of coping strategies were included in the analysis; problem focused, emotion focused, avoidant and faith based strategies. While traditionally coping strategies grouped under the "disengagement" domain have been construed as negative coping strategies, in Eastern Democratic Republic of Congo types of avoidant and faith-based strategies such as *trying to forget* and *praying*, may help to support youth mental health.

Problem focused coping was associated with increased internalizing and externalizing problems and reduced pro-social behaviors. Emotion focused coping had a positive mediating impact on self-esteem in boys. Avoidant coping reduced internalizing problems in girls but not boys; use of avoidant coping in girls also increased self-esteem. Faith based coping increased self-esteem in girls and boys. The interaction effect of use of problem focused coping with emotion focused coping reduced internalizing problems in girls and externalizing problems in boys and girls, suggesting that coping flexibility or use of more than one strategy can be beneficial to mental health. These findings suggest that interventions should consider approaches which support use of emotion focused strategies and consider ways that emotion focused and problem focused coping strategies can be used together to take advantage of their synergistic effect on reducing internalizing and externalizing problems and promoting well-being.

Coping strategies are related to risk and protective factors at the individual, family and community level. Having attachment relationships with peers, family and community provide

stability and structure as well as an opportunity for emotion expression. In general, girls are impacted more by caregiver mental health and family relationships whereas boys' psychological distress and well-being are influenced strongly by peer relationships. Greater cohesion and integration of family and community in intervention efforts can better support strength based interventions for youth.

Data from this research as it pertains to trauma affected youth mental health and well-being suggests that interventions should, 1) target support for multiple (grouped) coping strategies at the individual level 2) support reduction in psychological distress through improved family relationships, caregiver mental health and violence reduction 3) target improved well-being through support for peer and community relationships and enrollment in school, an institution particularly suited in supporting those relationships. This line of research has the potential to contribute toward the production of more effective interventions that promote building of a stronger set of coping strategies within youth's coping repertoire to reduce psychological distress and promote well-being.

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Appendices

Appendix A. Qualitative Instruments

ORAL ASSENT SCRIPT

PURPOSE: We want to talk to you about a research study we are doing. A research study is a way to learn information about something. We will ask about your daily activities, such as school, work and play and relationships with your family, friends and others in the community. We are asking you to join the study because your family is participating in a microfinance program, called Pigs for Peace and/or Rabbits for Resilience.

PROCEDURE: If you agree to join this study, you will be asked to complete an interview with a researcher. The interview will take about one hour to complete. The interview will begin with questions about your age, who lives with you in your household, and your daily activities. We will also ask you about your relationships with members of your family, friends and others living in your village. We will ask you about what you think or do when you are faced with challenging or difficult events.

RISK/DISCOMFORTS: Some of the questions may upset you, you do not have to answer a question. The information you share is personal and we will keep it confidential, which means we will not share it with anyone who is not involved in the study

BENEFITS Your time is important to us, so we will provide you with small compensation to thank you for your time.

VOLUNTARY PARTICIPATION: You do not have to join this study. It is up to you. You can say okay now, and you can change your mind later. All you have to do is tell us. No one will be mad at you if you change your mind. You can stop the interview at any time.

Before you say yes to joining this study, we will answer any questions you have.

ORAL CONSENT SCRIPT

PURPOSE: You and one child (ages 10-15 years) in your household are being invited to participate in this research study because your household is participating in the village microfinance program, Pigs for Peace and/or Rabbits for Resilience. We are talking with you and your child because we want to learn about youth health, coping with trauma or violence and relationships between household members and others in the village. We expect up to 48 youths and 48 adults to participate.

PROCEDURES: Your child will be asked to complete a face-to-face interview with a trained researcher. The interview for your child will be conducted separately and in private. Each interview will take about 60 minutes to complete. The interview will begin with questions about your child's typical daily activities, relationship with family members and others living in the village. We will ask about how your child has coped with exposure to trauma or violence. You may be asked to participate in private focus groups (7-10 members each) to provide feedback on your child's coping behaviors.

RISK/DISCOMFORTS: If there is a question that makes you uncomfortable, you and your child may refuse to answer any of the questions. The information you and your child share is personal and we will keep it confidential, which means we will not share it with anyone who is not involved in the study or who needs to make sure the study is being done correctly.

BENEFITS: You and your child may not experience a direct benefit from participation in the study. We will provide you with $2 for your time and your child with $2 for their time.

VOLUNTARY PARTICIPATION: You and your child's participation are voluntary. You do not have to join this study. If you and your child do join, and later change your mind, you both may quit

at any time. If you or your child refuses to join or withdraw early from the study, there will be no penalty or loss of service to which you are otherwise entitled.

Before you say yes to you and your child joining this study, we will answer any questions you have. Further, if you have any questions about your rights as a research participant, or if you think you have not been treated fairly, you may contact the agent for Pigs for Peace.

Interview Guide
Rabbits for Resilience (R4R)

Form 1. In-Depth Interview Guide: Youth

Interviewer Name:

Youth Identification Number:

Age:

Gender:

Village:

Date: ____/____/____ Interview start time: ___:___AM/PM Respondent

Purpose of this interview

Hi, my name is _____ from Johns Hopkins University and PAIDEK and we work with a project called Rabbits for Resilience. Thank you for making time to meet with us. We are talking to you today to ask about different types of problems (like having conflicts with family members and friends, feeling sad, being angry at people, not doing well in school and/or feeling sick) you and other youth in your village may experience. We want to learn what things you and other youth in your village do when you have problems and if it is helpful or not.

[consent/assent form here]

I. Ice-breaker questions:

- Could you tell me about your typical morning? For example, what time to you get up, what do you usually eat in morning, do you usually go to school?

- Could you tell me about what you do in the afternoon? For example, what do you do after school, do you have chores at home, do you have time to see friends?

- Could you tell me about what you do in the evening? For example, what do you usually eat, what time do you go to bed?

- What do you like to do in your free time? (play with friends, be alone, talk with friends, listen to music, dance, etc)

- Please tell me a little about your family (who do you live with, how many siblings, who do you have the best relationship with in your family?)

- Please tell me a little about the village you live in.
    - How do people in this village help each other?
    - What are good relationships youth have with others in this village?
    - Do you think the village is safe? Why or Why not?

II. Coping Strategy:

- OK, you're doing a great job. Can you tell me about something that happened to you that made you feel happy?
    - What happened? When did it happen?
    - What do you think or do when you are happy?

- Now I want you to tell me about something that happened to you that made you sad
    - What happened? When did it happen?
    - How did this affect you?
    - Tell me about something you thought or did when you were sad that was helpful

    - Tell me about something you thought or did when you were sad that was not helpful
    - Probe for a story or narrative

- Can you tell me about something that happened to you that made you feel angry?
    - What happened? When did it happen?
    - How did it affect you?
    - Tell me about something you thought or did when you were angry that was helpful
    - Tell me about something you thought or did when you were angry that was not helpful

- Can you tell me about something that happened to you that made you feel scared?
    - What happened? When did it happen?
    - How did it affect you?
    - Tell me about something you thought or did when you were scared that was helpful
    - Tell me about something you thought or did when you were scared that was not helpful

- Do the things you think or do when you feel sad or angry are helpful? Why or why not?
    - Probe for story or narrative

- If what you tried to make yourself feel better is not helpful, what do you do next?
    - Probe for a story or narrative

- Do you think you need to try different things to help you feel better? Why/why not?
    - Probe for recommendations or suggestions

- How do you think or act differently when you are happy than when you are sad?

III. Family:

Tell me about something that happened to your family that made you feel sad?

- What happened? When did it happen?
- How did this affect you?
- How did this affect your relationship with family?

Tell me about something that happened to your family that made you angry?

- What happened? When did it happen?
- How did this affect you?
- How did this affect your relationship with family?

Tell me about something that happened to your family that made you scared?

- What happened? When did it happen?
- How did this affect you?
- How did this affect your relationship with family?

- Can you tell me about how an adult in your family feels or acts when they are sad or angry?
    - Do you think the ways they act are helpful? Why or why not?

- How do your sisters/brothers feel or act when they are sad and/or angry?
    - What do you like or dislike about how your sisters/brothers act when they are sad or angry?

- Do you have a role in supporting your family's ability to deal with problems/difficulties? If yes, how do you support and/or help?

- What are ways that your family helps you to deal with problems/difficulties?

IV. Social/Peer questions:

- Can you tell me about other ways you've seen your friends think or act when they are sad and/or angry?
    - What are reasons that your friends think or act in this way when they are sad and/or angry?

- Do you have a friend you trust to give you good advice if you have a problem?
    - If yes, why would you ask that friend?
    - Probe for qualities/characteristics of person selected

- How does the advice you receive influence how you deal with problems/difficult situations?

V. Perceptions:

- Do younger children think or act in ways that are different from older children when they are sad/or angry?

- Do girls and boys feel or act in the same way when they are sad/and or angry? What are the differences?
    - Probe for a story or narrative
- Do girls and boys feel or act in the same way when they are happy? What are the differences?

VI. Coping and Health:

- Do the things you think or do when you are sad or angry change...
    - Your hope for the future? How?
    - Your interaction with friends or family? How?
    - Your ability to do daily activities? How?
    - Your self-esteem? How?

Close of interview:

- Do you have any questions for me or last comments? Thank you so much for your time.

Interview end time: ___:___AM/PM Respondent

Appendix B. Adapted KidCope-15

SITUATION: Think of something stressful you have experienced. For example, an experience that made you very sad, mad or scared.

Now please respond whether you used any of the following ways to help deal with this situation.

Coping Strategies	Did you do this? Y/N		How much did it help?		
1. I just tried to forget it.	Yes	No	Not at All	A little	A lot
2. I did something like listen to the radio or played a game to forget it	Yes	No	Not at All	A little	A lot
3. I stayed by myself or went for a walk by myself	Yes	No	Not at All	A little	A lot
4. I kept quiet about the problem	Yes	No	Not at All	A little	A lot
5. I tried to see the good side of things	Yes	No	Not at All	A little	A lot
6. I blamed myself for causing the problem	Yes	No	Not at All	A little	A lot
7. I blamed someone else for causing the problem.	Yes	No	Not at All	A little	A lot
8. I tried to fix the problem by thinking of answers	Yes	No	Not at All	A little	A lot
9. I tried to fix the problem by doing something or talking to someone	Yes	No	Not at All	A little	A lot
10. I yelled, screamed, or got mad	Yes	No	Not at All	A little	A lot
11. I was disrespectful to my parents	Yes	No	Not at All	A little	A lot
12. I tried to calm myself down	Yes	No	Not at All	A little	A lot
13. I sang a song to feel better					
14. I wished the problem had never happened	Yes	No	Not at All	A little	A lot
15. I wished I could make things different	Yes	No	Not at All	A little	A lot
16. I tried to feel better by spending time with other family or friends	Yes	No	Not at All	A little	A lot
17. I didn't do anything because the problem couldn't be fixed.	Yes	No	Not at All	A little	A lot
18. I slept.	Yes	No	Not at All	A little	A lot
19. I prayed.	Yes	No	Not at All	A little	A lot
20. I drank alcohol.	Yes	No	Not at All	A little	A lot
21. I stole things.	Yes	No	Not at All	A little	A lot
22. I tried to get revenge.	Yes	No	Not at All	A little	A lot

Appendix C. Human Risk Protocol

Risk to Subjects

Human subject involvement and characteristics: In participating villages, the village leaders will work closely with the RAs, study coordinator and research team members to select households that meet the eligibility criteria: village household with at least one youth age 10-15 years of age. This study targets early adolescent and adult (18 years and older) living in participating villages for individual, household and village level data collection. Microfinance mentors (local leaders including teachers, faith-based leaders, village chiefs) will complete brief interviews on youth participants (caregiving of animals, empathy, outlook for future). Additionally, youth (ages 10-15 years) will complete in-depth interviews at two time points for the qualitative component of the study. Dr. Glass and colleagues have significant experience in the ethical and safe implementation of research in community settings with youth, adults, marginalized populations and village leaders in DRC and other settings (Clough, 2010; N. Glass, Campbell, J.C., Njie-Carr, V., Thompson, T.A. , 2011; Wagman, Francisco, Glass, Sharps, & Campbell, 2008).

Inclusion of women: This study will include girls (ages 10-15 years) and women (ages 18 years and older). Girls will receive consent for their participation by parents/caregivers as well as provide assent prior to participation in the study.

Inclusion of men: This study will include boys and men. Boys (ages 10-15 years) and men (ages 18 years and older) are eligible to participate in the study. Boys will receive consent for their participation by parents/caregivers as well as provide assent prior to participation in the study.

Inclusion of children: Children ages 10-15 years and 18-20 years will be eligible for study participation. No children under the age of 10 years will be included as participants in the research study.

Inclusion of minorities: This study will be conducted in the Democratic Republic of Congo in the Ngweshe Chiefdom of the Walungu Territory of South Kivu, DRC. The majority of residents are Bashi.

Targeted/planned enrollment: Using our established partnerships with PAIDEK and leaders in the Ngweshe Chiefdom and Dr. Glass's previous experience in successfully recruiting participants for previous research projects in the targeted area, we estimated the enrollment for the proposed study at 984 (480 youth ages 10-15 years, 480 parents/caregivers, 10 mentors/parents for youth participating in youth-led microfinance program (see Targeted Enrollment Table). The racial categories provided in the enrollment form are not relevant to the study population.

Sources of materials: According to the research protocols outlined in the Approach section, primary sources of data include self-report data from eligible youth and parent/caregivers. Reports of youth's caregiving ability, empathy and outlook for the future by youth association mentors or parent/caregiver (in PFP microfinance only group) will be completed with study RAs. Qualitative in-depth interviews will be conducted with youth in each of the three groups.

Potential risks: The research team is well aware that questioning youth and adults about sensitive issues and topics can raise important questions about safety and issues of stigma. Potential risks to participants are loss of confidentiality, time involvement, fatigue, distress and embarrassment because of the nature of some of the questions, anxiety, depression, and potential retaliation from the intimate partner or other members of the household if they learn of sexual violence or other issues through the interview. All participants will be informed about the potential risks in participating and measures to take to protect one-self. All participants will be notified that they can withdraw from the study at any time without penalty or loss of participating in the microfinance program. Specifically, to reduce risk for coercion, youth and

adults are not required to participate in the study to be eligible for participation in the microfinance program. While no participant's safety can ever be completely guaranteed, we feel that with our detailed training, confidentiality, and safety procedures will minimize risk. Although the circumstances of war and loss are distressing for participant to discuss, traumatized persons generally find expression of feelings useful. As participants in previous research in DRC by the team reported that they wanted to tell their story. We will work with RAs and leaders to identify local advocates and community members to assist study participants with follow-up services post-interview. For example, we worked closely with community health workers in the local villages in the previous study in Eastern DRC to be available to study participants for follow-up emotional support and information about health and services following the interviews. The study research plan was developed with deliberate attention toward minimizing the risk of harm to participants.

The purpose of this study is to assist youth, families and villages to rebuild their lives in the post-conflict environment. As noted in the proposal, rebels and military have looted essential resources, such as animals from many rural village households in the targeted area. However, over the past 3 years, there has been increased security in the targeted area as related to UN Peacekeepers based in the territory, US training of Congolese military, military operations to arrest and move rebels out of the territory and the development of safety committees in the village for prevention and communication of risks to village households. Through our current project and research, a key question to village leaders and members in the targeted area has been if they believe it is safe for the population to implement microfinance programs in the targeted area. The overwhelming response by the village leaders and members has indicated that villagers who fled for safety are now returning to the area since security has increased, but they are returning to the loss of everything and the Pigs for Peace microfinance program as well as other

programs to engage youth should be initiated as productive activities are a critical need for the future safety of the villages.

Through our partnerships, situational assessment and pilot strategies, we believe we can work successfully with villages in the targeted area to minimize the risk of rebels and soldiers stealing resources of the microfinance program. One critical strategy we will implement will be meeting with UN Peacekeeping forces, local and international NGOs working in the area as well as the Congolese military leadership in the territory to inform them of the project and the purpose and ask for their partnership towards success. We believe engaging stakeholders in safety in partnership will be key to security and sustainability of the microfinance program. Additionally, in the monthly youth and adult association membership meetings, issues related to security and safety will be discussed and additional strategies informed by participants will be incorporated as needed.

In summary, this study provides an innovative opportunity to not only inform future interventions to improve the resilience of youth, family and villages post-conflict, a global priority - but also inform strategies for human subjects protections for research conducted in conflict and post-conflict settings. We must be able to successfully implement human subjects research to ensure evidence-based programs are being implemented to improve health, safety and economic outcomes for the population.

Adequacy of Protection Against Risk

Recruitment and informed consent: The recruitment and retention of participants is essential to the proposed study and therefore, the study team has existing partnerships with PAIDEK, expert consultation (Dr. Cinyabuguma and Dr. Bentancourt) and leaders in target Chiefdom to ensure access to eligible households and participants. Further, the team has significant experience in developing and using culturally competent protocols to maintain

confidentially and safely recruit and retain participants. The trained research team members will complete informed consent/assent at initial contact with the eligible participants.

Informed consent procedures for eligible youth and adults: The recruitment for the study will take place in the village in a private and safe place, either in the home, village center, under a tree in the village, wherever the youth and adults feels comfortable in discussing the study and asking questions. The study will be explained, along with the voluntary nature of participation. The informed consent/assent process will not include a signed consent form but rather a verbal consent in the local language provided to a trained RA. Not all household members will be able to read/write. Therefore, RAs and team members will be trained to verbally provide information on the study (purpose, procedure, risk, benefits).

Contact information will be collected for participants as appropriate as some village participants will have mobile phones for contact to set up data collection interviews. Study related contact information would be secured in the study office. No persons other than the investigators and study RAs will have access to contact information. Contact information for participants will be destroyed following completion of the study.

The safety procedures protocols will also be applied in the event that the study personnel are made aware of an immediately dangerous situation during the time of subject recruitment or completion of the study.

Protection against risk: The study investigators, who have extensive experience in the field of gender based violence, research with youth, community-based intervention longitudinal research and partnerships with diverse community agencies, will train all research staff. Research training will include sensitization to the experience of trauma and safety issues, as well as issues related to informed consent/assent. The informed consent/assent procedure will be implemented according to institutional review board guidelines. All participants will be provided information essential for informed consent prior to participation in the study. Steps to be taken

to protect the safety and confidentiality of all participants include the use of study code numbers for identification, reporting of aggregate data, omitting identifiers in the data collected and maintaining contact information separately from data, and destroying all contact information within 3 years after completion of the study. Additionally, we will develop and provide the research team with detailed and clear procedure for assessment and intervention in cases of suicidality. The protocol will include an algorithm for assessment, maintaining contact with participant, accessing study investigators and consultants for support and follow-up. All research team members will be trained using the approved protocol. The protocols has been successfully implemented previously by Dr. Glass and colleagues (Nancy. Glass, (In Review); N. Glass, Ramazani, P, Tosha, M, Mpanano, M, Cinyabuguma, M. , In Press).

Study Procedures and Safety Mechanisms During the Study: We are extremely concerned about the safety of participants, and indeed, this concern underlies the rationale for our procedures and research. Confidentiality is considered primary to this study protocol. Implementing important safety procedures for the interviews and handling study data will serve to protect participants from harm. During the study, participants may stop at any time. No information will be given out to anyone outside the research team about whether a particular household or individual participates in the study. Trained research staff will conduct all aspects of the study.

Study participants will participate in the study and be interviewed for eligibility only in private—that is, individuals not associated with the study will not be present or within hearing distance of the face-to-face interview. Participants may cease their participation in the study at any time, and research staff will be trained to stop the interview if a participant evinces psychological distress, verbally or non-verbally. Research team members may contact Dr. Glass at any time if staff is ever worried about how to proceed in an individual case. Dr. Glass has

extensive experience in working with survivors of violence and other forms of trauma (Clough, 2010; N. Glass, Rollins, C & Bloom, T 2009; Wagman et al., 2008).

Safety and Monitoring Plan

Safety mechanisms to ensure data privacy: All persons with access to data (PI, co-investigators, research coordinator, programmer, RAs, consultants) will rigorously follow procedures to ensure confidentiality of data. All data, including hard copies and backup storage devices will be kept in a locked file cabinets. Only a single computer file at the study site will contain information linking subject-identifying information (names) with study ID code. These sensitive files containing identifying information will be encrypted. This additional security requires the end-user to have both access authority and a password for the encryption/encapsulation. All other study materials and files will only include the study ID code (that is, all original forms, instruments, and computer data files). Dr. Glass has obtained Hopkins IRB approval for her previous and current research conducted in DRC, in partnership with the Catholic University of Bukavu (see attached approval letter from Hopkins IRB and Archbishop and Chancellor of the Catholic University of Bukavu, DRC in Appendix B). JHU operate and manage a Microsoft Windows computer network. The Computer Services department at the schools is responsible for overall management and security of the system. The computer system and security measures are audited approximately every two years. The computer system meets or exceeds the level and scope of security advised by the Office of Management and Budget. No data will be released that would allow the identification of any respondent, unless written informed permission for this is obtained from a participant. James Case, Hopkins Programmer has significant experience in working with the research team to develop secure website, data tracking and database that meet HIPAA and security requirements.

Detecting adverse events. The major adverse event anticipated is further victimization (stigma, rejection from family and village, stolen property) related to participating in the study.

For example, it is feasible that a husband, father or other family members learns about the rape or other trauma only after the youth or adult participates in the study. Further, it is feasible that the perpetrator of the rape may return to the village after learning of the study. Additionally, the youth and adults could have their animals stolen during the course of the study. Every attempt will be made to protect participants from further victimization. All members of the research team will be trained to strictly follow the confidentiality and safety protocols for participants as described above. Participants will be asked to determine a safe and convenient time for participation. The study team will develop a critical incident report for documenting adverse events, action taken and follow-up procedures for the action. A Safety Monitoring Board (SMB) will review these critical incidents. All protocols developed to maintain participant safety and to detect potential adverse events will also include the standards of Institutional Review Boards.

Study monitoring procedures. Several procedures will be used to monitor participant safety and to detect adverse events. A two-member SMB will be established to insure the safety of participants; one will have expert knowledge of culturally competent care to survivors of violence and trauma and the other will have expert knowledge in human rights and ethical research in conflict and post-conflict settings. The SMB will be responsible to ensure that all study and intervention protocols to insure safety are adhered to consistently. The SMB will receive monthly monitoring reports from the PI about the progress of the study and the implementation of study protocols. The reports will contain information on any deviations from study protocols with rationale and outcomes and the SMB will communicate or meet with the research team within 2 weeks of receiving the monthly reports. The SMB will be responsible for clarifying concerns with any deviations in study protocols and providing recommendations to insure the research team continues to adhere and implement the study protocols safely and consistently.

Resource Sharing

Data sharing plan. Sharing of data generated by this study is an essential part of our proposed study activities and will be carried out in several different ways. We would wish to make our results available both to the community of scientists interested in structural determinants of health, health disparities, youth and family resilience, economic development interventions in conflict and post-conflict settings, safety and mental health outcomes. Further, the results will be shared with international donors and policymakers, human right advocates, legal advocates and mental health care providers working in complex humanitarian crisis. Toward this end, we will create a database consisting of all human participant data collected in this study. This database will be shared with our co-Investigator at Johns Hopkins University, Kaiser Center for Health Research, Columbia University and Harvard University. The human participant database will not contain personal identifiers or links to participants. The purpose of the database is to enable additional exploratory analyses that lead to additional dissemination through oral presentations at scientific conferences and manuscripts. As new findings emerge from the study, we will possible secondary analyses to further explore the data. Results will be shared with global organizations working in conflict and post-conflict settings as well as organizations implementing microfinance with rural villages. Participants in the study (PAIDEK and Consultant) will be invited to request findings from the study are aggregated to the territory level.

Sharing research resources. The resources that will be generated by this study include the training protocols and manuals for RAs and conducting village-led intervention studies in conflict and post-conflict settings, Youth-led microfinance and PFP village association guidelines and education topics, microfinance program model for rural villages, as well as interview data from the participants in the households. Requests for specific data will be honored from science-based organizations seeking to conduct meta-analyses of such data. We will, however, make aggregated data from the analyses available to qualified researchers through publications and presentations at scientific meetings.

Curriculum Vitae

Megan Lehn Cherewick was born in Lansing, Michigan on 26 December 1982. Megan completed a Bachelor of Arts (BA) in Sociology with sub-concentration in Social Inequality: race, Class and Gender with High Distinction from the University of Michigan College of Literature Science and Arts and a Bachelor of Fine Arts (BFA) in Printmaking, Summa cum Laude from the University of Michigan School of Arts and Design in 2006. Megan completed a Masters in Public Health from the Department of Health Management and Policy at the University of Michigan School of Public Health in 2009. Megan has worked at the University of Michigan Edward Ginsberg Center for Community Service and Learning, The University of Michigan Center for Global Health, and the University of Michigan School of Public Health. Megan has conducted independent research in Rwanda, Ghana and the Democratic Republic of Congo. Megan has worked as a teaching assistant for the Center for Refugee and Disaster Response and for courses in the Department of International Health at the Johns Hopkins Bloomberg School of Public Health. Megan was the instructor for an undergraduate course, Mental Health in Humanitarian Emergencies.